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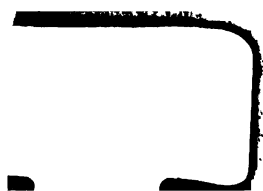
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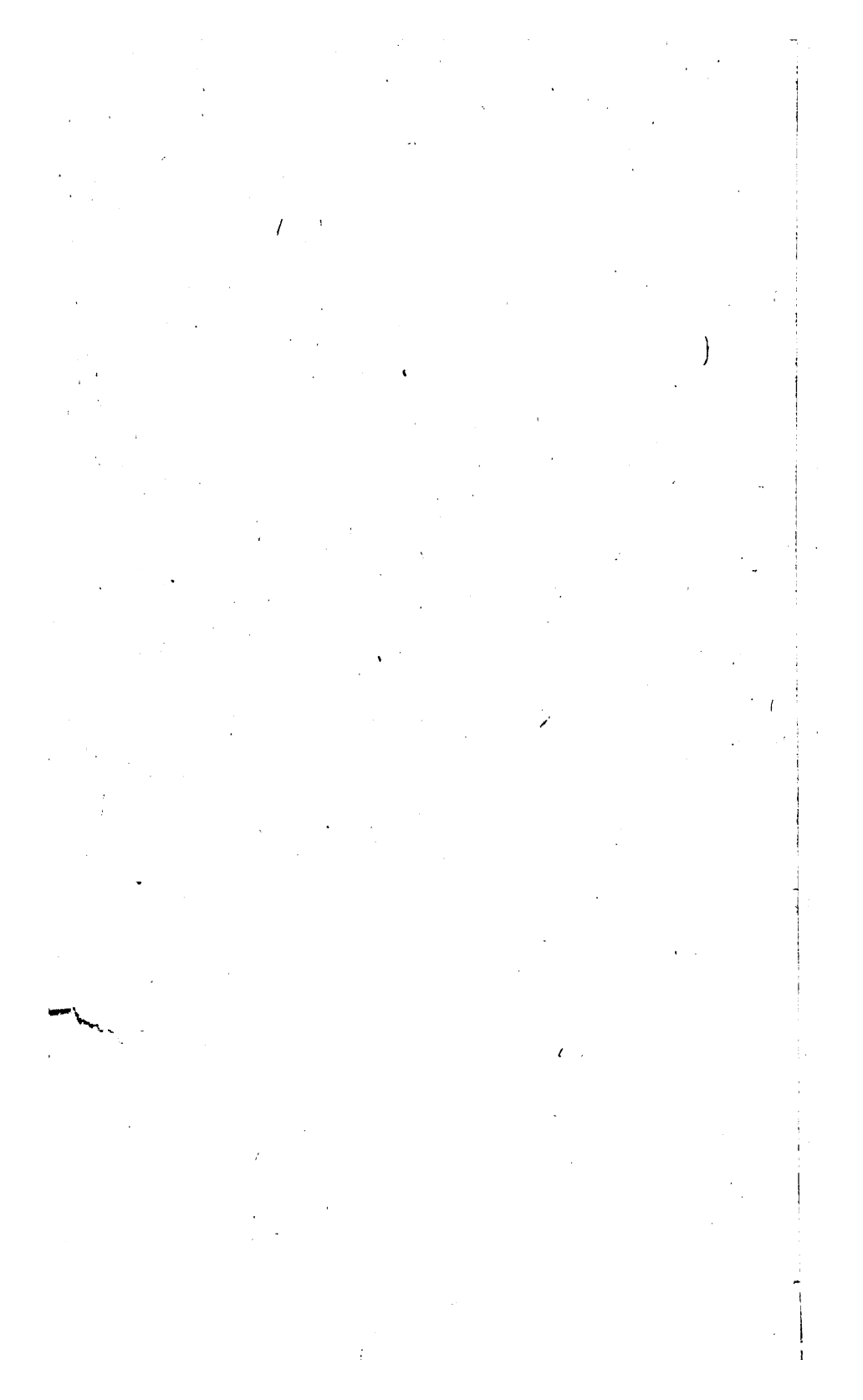
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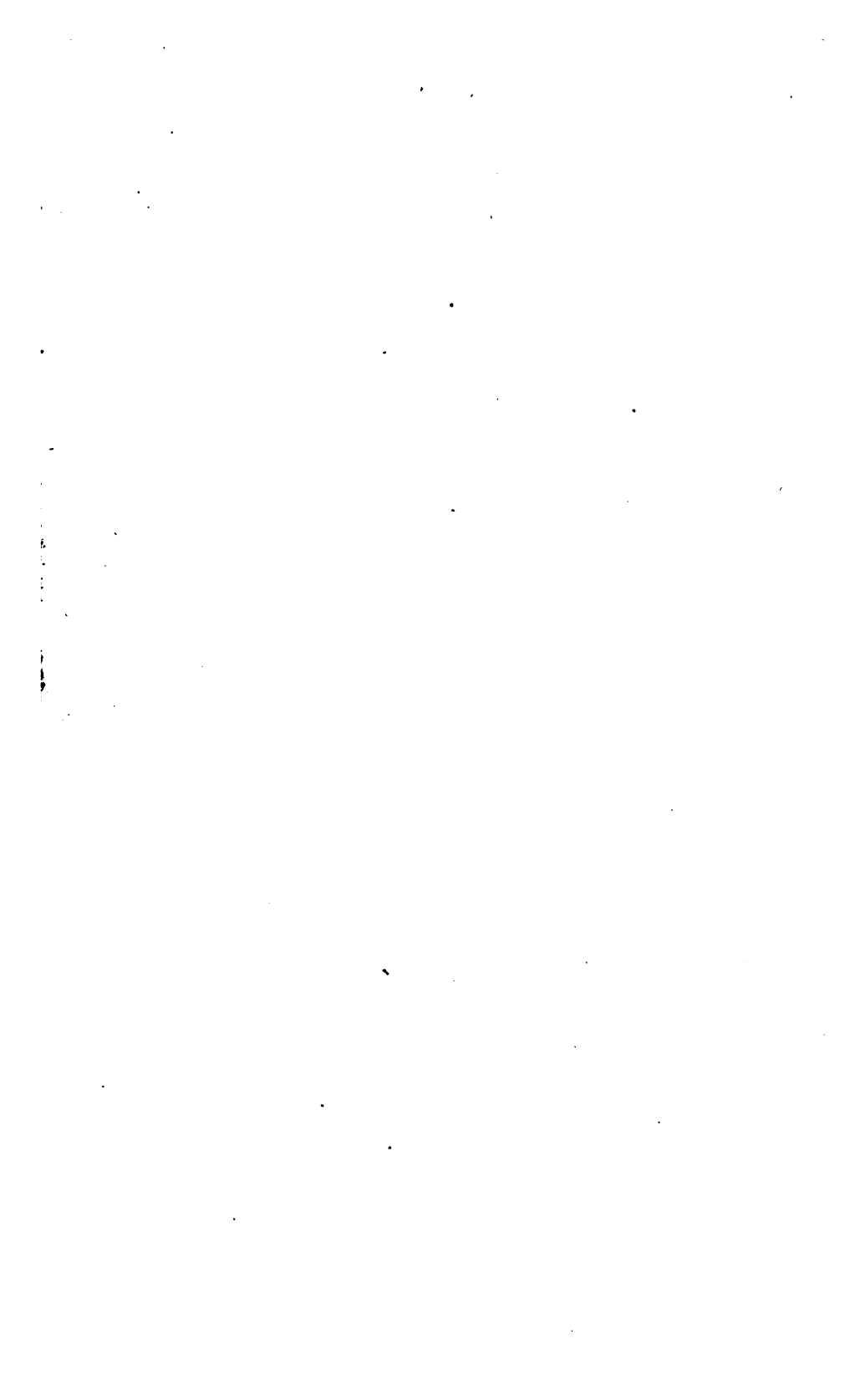
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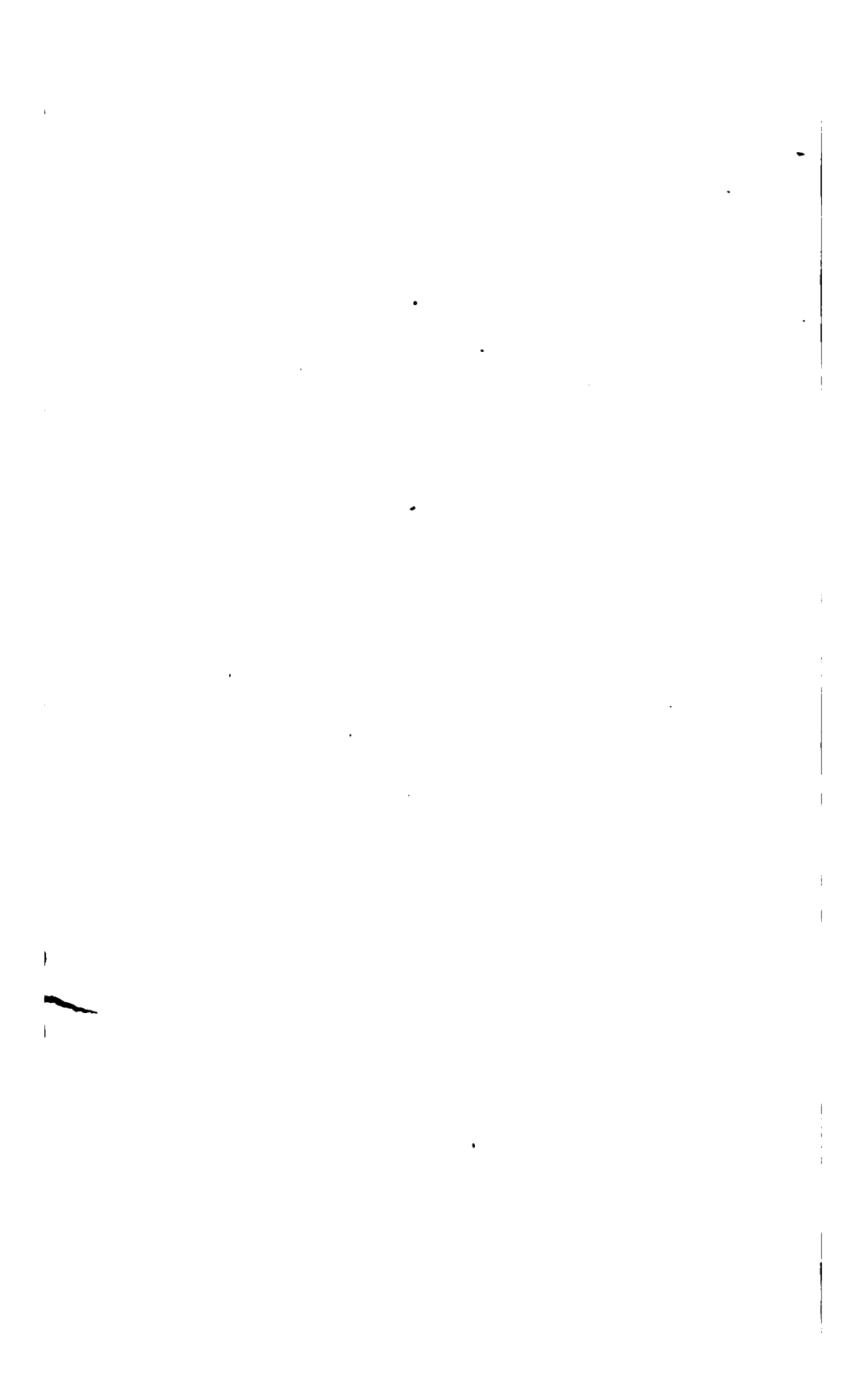


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A GUIDE
TO THE ANTIQUITIES OF
THE STONE AGE
IN THE DEPARTMENT OF
BRITISH AND MEDIEVAL ANTIQUITIES.

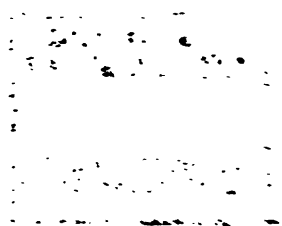






PLATE 1. CARVED DAGGER-HANDLES OF THE PALAEOLITHIC PERIOD.
(Case 114, *see* p. 49.)

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BRITISH MUSEUM.

A GUIDE

TO THE ANTIQUITIES OF

THE STONE AGE

IN THE DEPARTMENT OF

British Museum.

BRITISH AND MEDÆVAL ANTIQUITIES, Dept. of.

WITH TEN PLATES AND 142 ILLUSTRATIONS.

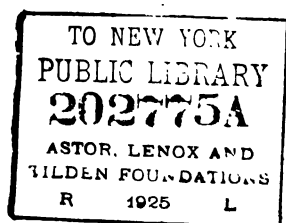
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P R E F A C E.



THIS brief Guide to the collections representing the stage of culture known as the Stone Age has in many ways proved more difficult to prepare than a work of larger compass. The evidence is often so largely inductive, and for the earlier or Palaeolithic period depends to so great an extent upon geological data, that it is impossible in so short a space to do more than suggest the difficulties which surround many of the lesser questions.

Two circumstances combine to render incomplete both the Guide and the collections which it describes. In the first place, many objects essential to a full understanding of these early periods are at the Natural History Branch, Cromwell Road; secondly, the collection here exhibited is very unequal. The Scottish, Russian, and German sections are by no means adequate, while some localities and some classes of implements from England and Wales are not so well represented as they should be in the National Collection.

The convenient term Stone Age has been used throughout because it is commonly accepted and universally understood; but it must be held to denote a stage of human culture rather than a division in time. As civilization advanced, other materials came by degrees into general use without immediately supplanting the old. It is therefore possible that certain implements noticed in the present Guide were made after the discovery of bronze; on the other hand, objects from the round barrows which are usually ascribed to a people acquainted with metal have not been included, though very similar types may be observed in the neolithic section of the gallery. It is felt that the contents of round barrows would be more properly included in a separate Guide to the Antiquities of the Bronze Period.

A very large proportion of the collection is due to the enlightened liberality of Mr. Henry Christy, who, up to the time of his death in 1865, spent much of his leisure in forming an ethnographical collection, in illustration of which he acquired an extensive series of prehistoric stone implements, the whole being eventually given to the British Museum. His most

important work in connection with prehistoric archaeology was the exploration of the bone-caves of Dordogne, where he discovered, in conjunction with Monsieur Edouard Lartet, the wonderful drawings and carvings of the Cave period. A sense of international justice led him to desire that the finest pieces from these discoveries should be returned to France; hence, a number of carvings, as well as the engraving of a mammoth, perhaps the best example of palaeolithic art, are only represented in his own collection by plaster casts. A portrait bust of Mr. Christy stands at the foot of the spiral staircase leading from the Stone Age Gallery.

For a few of the illustrations the Trustees of the British Museum have to thank Mr. Worthington G. Smith, in whose work on primeval man figs. 2, 3, 4, 9, 11-14, and 141 have been published: and the Society of Antiquaries of London for figs. 87, 112, 136-140, and 142. Nearly all the other drawings, as well as the plates, have been specially prepared for this Guide, and comprise a large number of objects that have not been hitherto published.

It may be added that where the illustrations are not full size, the amount of reduction is indicated by a fraction; thus, $\frac{1}{2}$ means that the original has twice the length and breadth, but four times the area, of the reproduction.

CHARLES H. READ.

THE antiquities of the Stone Age from this and other countries are arranged as far as possible in chronological order, beginning with the palaeolithic series in Wall-Case 99, which is reached by the western spiral staircase, on the left of the opening into the Prehistoric Room. At the foot of this staircase is a map of England and Wales, marked to show the sites of bone-caves and palaeolithic discoveries; while at the top of the stairs a relief map of the Thames Valley near London shows the extent of the ancient river-bed, now occupied by gravels and brick-earth, and the southern limit, at Finchley, of the Boulder clay (coloured blue).

Specimens of worked flint, showing the peculiarities by which human work in this material can be distinguished from flints chipped or fractured by natural agencies, are exhibited in a section of Table-Case B (see p. 115) on the floor of this room, and may be usefully studied before an inspection of the flint implements exhibited upstairs. For the block of breccia in Table-Case T between the spiral staircases, see pp. 35, 42.

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THE PREHISTORIC PERIODS.

The several epochs, or stages of culture, through which man is believed to have passed before the period of written history, have been divided into four, and the following names, originally proposed by Sir John Lubbock (now Lord Avebury), have been generally adopted for them :—

i. Palaeolithic Period (from the Greek words *παλαιός λίθος* = old stone).

ii. Neolithic Period (from the Greek words *νέος λίθος* = new stone), ending in Northern Europe possibly about 1800 B.C.

iii. Bronze Period, ending in this part of Europe about 500 B.C.

iv. Early Iron Period, represented in Britain by the Late Celtic or early British culture.

It must not be imagined that in the Bronze Period stone had been discarded for many purposes, or that bronze was no longer in common use after the discovery of iron. On the contrary, either material survived long into the succeeding period, and the lines of division must necessarily be somewhat arbitrarily drawn. But the classification is a convenient one as showing the material chiefly in use, and has been generally accepted by archaeologists.

It is only with collections illustrating the first two of these periods that the present guide-book deals, and the older series is illustrated in Cases 99–119, beginning at the top of the spiral staircase which leads to the iron gallery round the Prehistoric Room.

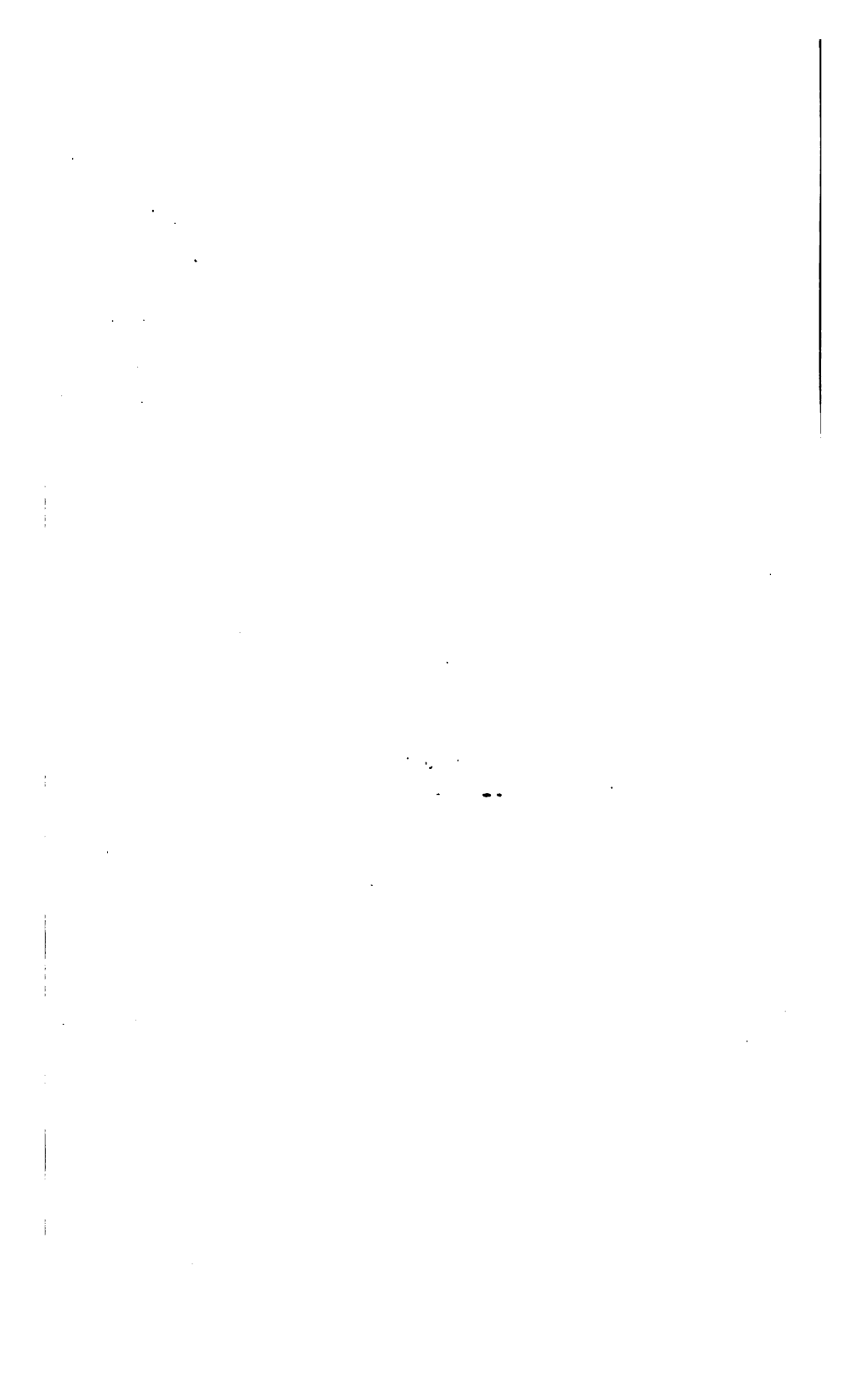




PLATE 2. FLINT IMPLEMENT FOUND IN GRAY'S INN LANE.
(Case 105, see pp. 1 and 22.)

THE PALAEOLITHIC AGE.

THE conditions of man's existence upon the earth during the early stages of his history are shrouded in great obscurity; and though many points may now be considered as fairly established, a great deal still remains in the region of hypothesis. Implements of chipped flint are *generally* regarded as the earliest traces of the human race, and these are commonly found at various depths in the gravels of the present river system. Palaeolithic implements had no doubt frequently been found before it was recognised that they belonged to a remote prehistoric epoch; but the first recorded discovery of the kind was made in England towards the end of the seventeenth century. A fine pear-shaped implement (plate 2, Case 105) was "found with an elephant's tooth opposite to Black Mary's, near Grayes Inn Lane, London," and was described as a British weapon. The true significance of worked flints was not, however, recognised till a century later, when Mr. John Frere, in describing his discoveries at Hoxne, Suffolk, in 1797, referred these implements "to a very remote period indeed, and to a people who had not the use of metals." No remarkable discoveries appear to have been made from that time until about sixty years later, when M. Boucher de Perthes discovered in the gravel deposits of the Somme Valley at Abbeville large quantities of implements evidently fashioned by the hand of man. From that time the existence of similar deposits has been established over a large area, and a close connection noticed between these relics of human workmanship and bones of animals, many of which are now either extinct or living only in remote latitudes.

The discussion as to the meaning and age of the implements found at Abbeville raised the whole question of the antiquity of the beds containing them; and a short recital of the evidence then brought forward will show what are the grounds for attributing a very high antiquity to these products of the human race.

That the implements are at least as old as the beds in which

they occur is shown both by the condition of the chipped surfaces, which are stained in the same way and to the same extent as the unworked flints in the same bed, and by the signs of rolling to which many of them had been subjected previous to the deposit of the gravel where we now find them embedded. It has been objected that the presence of mammalian remains does not prove that animals now extinct were living while the beds were being deposited by the torrential rivers of that epoch; but the repeated discovery of parts of the skeleton in their natural relation to each other shows that the flesh was still on the bones when the carcase sank in the water, and that we have not to do with stray fragments washed out of an older stratum. It may be taken therefore that the remains of extinct mammals serve to date the implements found in association with them (see Case 104), and that the determination of the relative age of the gravels is a fair

SECTION OF RIVER-VALLEY, SHOWING TERRACES.

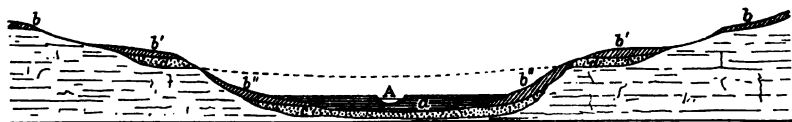


FIG. 1.—A. Present river. a. Recent alluvium. b, b', b'', Brick-earth on different levels and of different ages. c. Low-level gravels. d. High-level gravels.

criterion of the period that has elapsed since the mammoth and rhinoceros haunted the valley of the Thames, and man was compelled to face them armed only with weapons of flint.

The sands, loams and gravels in which these implements are commonly found may be roughly divided into (i.) glacial drift deposited at a time when icy conditions prevailed, and (ii.) post-glacial or river-drift, deposited at a later period, when the glacial conditions had either passed away or been modified. It is often, however, difficult to distinguish these classes; and, apart from the plateau gravels, it is usual to speak of the gravels connected with the present river systems as river-drift.

Palaeolithic implements have been distinguished from the ground and polished productions of the later Stone Age by calling the former the "river-drift" type, a term that serves to indicate the geological position of most of the specimens. The gravel beds are found in terraces up the sides of river-valleys, and were deposited at different periods by the river, to

which must be attributed a much greater carrying power than it now possesses. It will be evident from the accompanying figure that the higher terraces were formed before the lower, and consequently the higher the position of the terrace-gravels the greater must be the antiquity of the implements contained in them, supposing no disturbing agencies to have been at work.

It is interesting to note that what are considered the oldest flint instruments found in France occurred in gravel very little above the bottom of the present valley. This was at Chelles-sur-Marne, about eight miles east of Paris, where three successive layers of gravel surmount the tertiary deposits. The lowest of the three contained fossil bones of *Elephas antiquus*, *Rhinoceros merckii* (*leptorhinus* or *hemitoechus*) and *Trogontherium cuvieri*, all of which occur among the earliest pleistocene mammals; in this deposit the implements were unrolled, and there was no trace of the mammoth or woolly rhinoceros. Above this was a bed with water-worn pebbles and bones of the mammoth, while the uppermost bed was sandy gravel containing erratic blocks, flint implements of the later type, such as occur in the cave of Le Moustier, and remains of the ox, horse, and deer.

The implements of the lowest bed are more roughly made than those found above them, and the fauna justifies their attribution to an earlier date; hence it is clear that the oldest types are not always found in the high-terrace gravels, but that the valley was practically cut to its present depth at the opening of the quaternary or pleistocene era. Though implements lying in the bed of the river when the major valley had been cut (shown by the dotted line in the diagram) would naturally seek a lower level as the valley deepened, and might thus eventually rest on the lowest terraces, it is still difficult to see how they could have escaped considerable rolling in the interval; and the discovery at Chelles bears witness that the earliest did so escape, though subsequent deposits contained implements evidently of later date that were much water-worn.

The terraces, which are often observed on a river's banks, are mainly due to two causes, both connected with the excavating and transporting powers of the river. On the one hand, if the sides of the valley consist of beds, of which some are harder than others, the more durable rocks will stand out as cliffs, while the softer strata will form gentle slopes between them; and on the other hand an old river valley may have been subjected to successive excavations by floods, which, by scouring out the bed of the stream, lower the water-level, and also

deposit mud and silt along the sides of the channel. As a general rule the gravel, containing as it does rolled stones sometimes of considerable size, may be regarded as a deposit left by the river when melting snow or excessive rains have made it a torrent; and the loess or brick-earth, which occurs, for example, in south-east England, and is considered by eminent geologists to be equally a river-deposit, may be looked upon as a subsequent deposit of matter held in solution by flood-waters as they spread over the more level parts of the valley. It must be remembered in estimating the volume of a river in palaeolithic times, that though the upper terraces were formed and left dry (except when below the flood-level), before the deeper part of the valley was excavated; yet the river at no one period occupied the whole of the valley between the uppermost terraces, and only laid down the present expanse of gravel and brick-earth by constantly shifting its meandering course.

However, the flow of water, due to extraordinary conditions in the present drainage areas, must have been enormous; and there are abundant traces of an Ice Age which would account for the great breadth of the older river-valleys. But though the melting of an ice-sheet or a system of glaciers would enormously increase the volume of a river draining the area covered, this would only apply to certain rivers; and the great water power of others, such as the Somme, may be due to the high ranges of hills in which they take their rise and to larger areas of drainage. Still the high-level gravels generally may be said to mark a period during which the winter temperature was gradually becoming less rigorous, and the excavation of the valleys proceeding with greater energy as the mean annual temperature rose.

After the deposit of the tertiary beds which indicate a gradual transition from tropical to temperate conditions, a period of intense cold set in known as the *Glacial* or *Ice Age*. For some of the time a great part of this country was sunk in the sea to a depth of at least 500 feet, and was subsequently raised to about the same height, which is about the present level. The occurrence of northern and arctic species of shells in the gravels deposited during the depression show that the climate was very severe, and that our seas contained many icebergs. The same rigorous climate continued after the upheaval, and our northern counties, with the exception of the highest mountains, were covered with a great ice-sheet, which is shown to have been 1600 feet deep near Shap, Westmoreland, by scratched rocks high up on the mountains; 2300 feet in the West Riding and the Cheviots;

3000 feet in north-west Scotland, and twice that thickness in Scandinavia. The ice therefore thinned out towards the south, and even at the time of its greatest extension did not pass beyond the valley of the Thames. This is shown by the distribution of the boulder clay, a glacial deposit which is not found south of London, but occurs sometimes in as many as four strata in East Anglia. This goes to show that there were comparatively mild periods in the Ice Age, the glaciers temporarily retreating northwards; but the subsequent disturbance of the various deposits renders a complete record of these climatic changes impossible.

That the temperature was not uniform is, however, sufficiently shown by the frequent discovery in the drift and terrace-gravels, along with temperate species, of remains of animals now either extinct or living only in extreme climates. The following list of mammals found in British river deposits shows the intermingling of species now widely separated, the letters N, T, and S appended to certain of them denoting the decided preference of their present representatives for a northern, temperate or southern zone respectively.

| | |
|----------------------|--|
| Brown bear (T). | Urus (T). |
| Grizzly bear (T). | Bison (aurochs) (T). |
| Ermine (T). | Large hippopotamus (S). |
| Otter (T). | Wild boar (T). |
| Fox (T). | Horse (T). |
| Wolf (T). | [quitatis). |
| Cave-hyaena (S). | Woolly rhinoceros (tichorinus or anti- |
| Cave-lion (S). | Rhinoceros merokii (leptorhinus or |
| Irish deer (elk). | hemitoechus). |
| Extinct fallow-deer. | Elephas antiquus (straight-tusked). |
| Reindeer (N). | Mammoth (El. primigenius). |
| Roe-deer (T). | Lemming (N). |
| Stag (T). | Pouched marmot (spermophile) (N) |
| Musk-sheep (N). | Hare (T). |
| | Mouse. |

Of these animals several, such as the stag, roe-deer, cave-bear, urus, horse, hippopotamus and *Elephas antiquus*, occur in the forest-bed, and are thus proved to have existed before the great Ice Age. It may be observed that all the pre-glacial animals represented at the present day point to a temperate or moderately warm climate; while later arrivals like the reindeer, musk-sheep, marmot and lemming are specially adapted to sub-arctic conditions.

The range of drift-type implements outside Europe has not been accurately determined, as there is seldom sufficient

geological or palaeontological evidence for their date, and form alone is not an absolute criterion. Even the gloss that often appears on implements may sometimes lead to erroneous conclusions, as broken specimens have been found in the Libyan desert, which show very unequal weathering of the surface when the parts are joined together again. Of the types that are familiar from the river valleys of France and southern England, numbers of undoubted examples have been found; but they are specially abundant in France, and exceptional in Belgium, Germany, Austria, Hungary and Russia. In Italy, with few exceptions, palaeolithic flakes alone seem to have been discovered (see Case 139); but Spain furnishes some excellent and well-attested specimens from the neighbourhood of Madrid (see Case 109) and elsewhere. Portugal and Greece have also produced examples; but outside Europe, finds in Egypt, Somaliland, Cape Colony, Madras and certain other localities still give rise to controversy, and their palaeolithic age is by no means fully established. Specimens of this kind are therefore exhibited at the other end of the gallery (see Cases 42, 43, 147-149).

The extension of the ice sheet and of glaciers is generally recognised as a sufficient explanation of the absence of palaeolithic implements in Scandinavia, in Ireland, and the north of Britain; and English finds appear to be practically confined to the area south of a line drawn from the Wash to the Bristol Channel. The Thames is the southern limit of the ice sheet here, but the various strata of boulder clay in the eastern counties are enough to show that this area was not always covered, while the country north of Leeds, for instance, was still unapproachable; and in the opinion of Sir John Evans further discoveries may prove that palaeolithic man advanced considerably to the north of the line just mentioned. A careful examination of the old gravels of the river Rea at Saltley, Warwickshire, has brought to light a well-chipped implement of the drift type, not indeed of flint, but of quartzite pebble, which suggests a connection with the implements and flakes of that material found in the lower levels of the bone caves of Creswell Crags (see Cases 123, 124). An undoubted flint implement of palaeolithic type has also been found at Lincoln; but it must be confessed that these are at present only isolated instances. Nevertheless there are sufficient reasons why implements of the drift period should escape notice in the north, presuming that they were ever manufactured in that region. Flint is extremely rare over a great part of the area; and where other stone is used, the evidence of human workman-

ship is not so conspicuous. Owing to the nature of the rocks, the alluvial deposits differ from those in the south, and are not so frequently excavated for economic purposes.

Whether man was living before the intense cold set in, and survived the rigours of the glacial period, has long been a subject of discussion; and much evidence has been adduced on both sides. Discoveries of actual human remains have indeed been made, both in this country and abroad, which point to a very early appearance of man in this part of the world, but there is in almost every case an element of doubt as to the exact position in which the bones were found, if not as to the geological date of the stratum concerned. Certain portions of a human skeleton, including part of a skull, were found in the extension of the docks at Tilbury and are preserved in the Natural History Museum; but it is very doubtful whether they can be referred to the palaeolithic period. The skull does, however, agree very well in character with the Neanderthal type (see p. 37), which is conspicuous for its eyebrow protuberances and low crown; and the depth at which the discovery was made, 32 feet in a bed of sand, would justify us in assigning a great age to these remains, which may perhaps be classed with the skull fragment found 7½ feet deep at Bury St. Edmunds. As this was only a part of the crown, very little can be said as to the character of the skull; but the geological evidence is here important, as the bed was a deposit of red loam which must have been formed long before the complete excavation of the Linnet valley. It was a pocket eroded in the chalk, about 100 feet above the level of the Lark at Fornham; and in similar pockets on the same hill palaeolithic implements have been found from time to time, and also, it is said, the entire skeleton of a man at about 8 feet from the surface, in undisturbed brick-earth near the tusk of an elephant. Other human remains have been discovered in gravel beds at Galley Hill, Kent; and at Hamilton, co. Sligo, but cannot be regarded as indubitable remains of palaeolithic man.

The best evidence for the co-existence of man with an extinct fauna in this country is still derived from his handiwork. Hoxne is a classical site for palaeolithic implements, and investigations have been made there by an influential committee, with a view to settling the relation of palaeolithic man to the glacial epoch. Borings were made in an old buried river-channel which after the deposit of the chalky boulder clay (the latest glacial deposit on this site) became a freshwater lake, and on the lacustrine deposits rests the brick-earth. The

following were the beds reached by the borings in Hoxne brickyard:—

1. Brick-earth with freshwater shells, wood, and palaeolithic implements.
2. Gravel and carbonaceous loam.
3. Black loam with leaves of arctic plants.
4. Lignite with temperate plants.
5. Lacustrine clay with temperate plants.
6. Sand full of water.

The work was hindered by floods at the lower levels, but the committee were convinced that the well-known palaeolithic implements of Hoxne are much later than the boulder clay of that district; and the borings show that man was separated from the glacial epoch by two climatic waves. It is, however, stated that in other districts man may be inter-glacial or pre-glacial; and there seems sufficient evidence even in East Anglia for a much earlier appearance of man than the Hoxne beds indicate. The geological survey shows that there are three distinct horizons of beds yielding palaeolithic implements, and of these three, one is older than the chalky boulder clay. The following succession has been noticed, in descending order:—

- | | | | |
|------------------------------|---|---|----------------|
| 1. Neolithic period | . | . | post-glacial. |
| 2. Hesse boulder clay | . | . | glacial. |
| 3. Late palaeolithic | . | . | inter-glacial. |
| 4. Purple boulder clay | . | . | glacial. |
| 5. Intermediate palaeolithic | . | . | inter-glacial. |
| 6. Chalky boulder clay | . | . | glacial. |
| 7. Early palaeolithic | . | . | inter-glacial. |
| 8. Lower boulder clay | . | . | glacial. |

An example of No. 3 is the Little Ouse valley from Thetford westwards, which cuts through boulder clay and contains flint implements in its gravels. No. 5 is illustrated by an old river system noticed at Brandon and elsewhere. The deposits are gravels now capping the hills at a height of 70 feet above the present river. This system is nearly at right angles to the rivers Lark, Little Ouse, and Stoke, and is indeed cut through by them; and quartzite as well as flint implements have been found in its gravels, as at Brandon Field or Gravel Hill, Lakenheath Hill, and Portway or Marroway Hill. The oldest implements (No. 7) occur in a series of loams, sands and gravels overlaid by the chalky boulder clay, and known as the Brandon

beds; and specimens have been collected from this horizon at Botany Bay (near Brandon), Mildenhall brickyard, High Lodge (Mildenhall), Bury St. Edmunds, West Stow, and Culford.

The classification of palaeolithic implements according to types suggests a relation between form and relative age that cannot be proved till further definite evidence is forthcoming. It is generally held that the drift implements are older than specimens derived from the bone-caves of England and France; but there is at least nothing in the fauna in favour of that supposition, and there are certain considerations that give colour to the contrary opinion. Though form by itself is no criterion of age, it is unlikely that the carefully chipped implements of the drift are the earliest attempts at flint-working on the part of man; and apart from the question of the "eolithic" variety to be presently discussed, the rude quartzite implements found below the flint level at Creswell crags, and the Warwickshire specimen already mentioned, are as likely to have been worked before as after the furthest advance of the ice-sheet. Again, flint implements discovered at High Lodge closely resemble a large number found in one of the French caves and known as Le Moustier type (*cf.* specimens in Cases 106 and 111). In England these are known to have occurred *below* the boulder clay which marks the great Ice Age, and it is to this same period that the characteristic deposit at Le Moustier was referred by an eminent French archaeologist (M. Mortillet), whose classification is widely recognised. The typical locality in France for implements of the drift type is Chelles (Seine-et-Marne), and, according to some authorities, a later stage is marked by the implements from St. Acheul, near Amiens, these belonging to types intermediate between the Chelles and cave series. A large number of the so-called "coups-de-poing" may be seen in Cases 107, 108; but no chronological order such as the French scheme implies has yet been established in this country. As a matter of convenience, however, the following main types may be distinguished, but it remains for future investigators to determine their proper sequence.

1. Flint flakes, some showing subsequent chipping at the edges.

2. Scrapers, consisting of large flint flakes with a rounded cutting edge produced by chipping on one face only: the side opposite the cutting-edge is thicker and often has patches of the original crust.

3. Pointed or pear-shaped implements, generally with a heavy, rounded butt, sharp edges at the sides and a pointed end.

4. Discs, very coarsely worked: thick in the centre and brought to a cutting edge all round.

5. Oval implements with a sharp edge all round and thickening towards the centre.

The proofs afforded by remains in the drift gravels, regarded in connection with discoveries in palaeolithic caverns subsequently to be described, are practically unassailable; but clearer evidence is still needed to prove the existence of man in the tertiary period. According to some investigators traces of his presence are to be seen in certain rudely-chipped flints found in gravels which seem to have belonged to a river-system totally unlike the present. The true nature of these flints has been the subject of some controversy, for though their tertiary age is generally conceded, it has been urged that the apparently intentional chipping has been produced by purely natural agencies. Such flints, to which the name of Eoliths (*ήώς*, dawn and *λίθος*, stone) has been given, have been found in considerable numbers in various parts of the South of England, notably on the Kent plateau in the neighbourhood of Ightham, and a series is exhibited in Case 106 from this locality. It is not the province of the present guide to enter into the arguments which have been brought forward against or in favour of the artificial character of Eoliths, but it may be said that whether their claims can be substantiated or not, the existence of implements of a ruder kind than those of the drift is in itself not improbable. For no invention reaches perfection suddenly, and each stage of advance is attained by an infinitely slow progress from the simple to the more complex. The majority of the drift implements are clearly something more than the first efforts of an unpractised hand; they show on the contrary signs of a comparatively long development, and it may be fairly argued that their ruder prototypes must exist somewhere. It was only to be expected that they should have escaped notice for a longer time than the typical Palaeoliths, if only because they must necessarily be more difficult to distinguish from naturally fractured flints. We may draw similar conclusions from a consideration of the stone implements of the most primitive savage tribes. The knives of the now extinct Tasmanian aborigines were of the rudest description, generally chipped only on one side, and quite devoid of symmetry. The Andamanese had implements of a yet more elementary kind, and the Semang, a similar negrito tribe of the Malay Peninsula, are said only to have stone implements in the sense that they pick up and use such convenient fragments as they may chance

to find, usually employing shell, bamboo or wood to provide for their simple needs. There are, therefore, still in existence peoples to whom, from climatic and other reasons, stone implements are of only secondary importance; and though their civilisation is low, it must be higher than that of the earliest representatives of the human race. Yet supposing the negrito tribes had died out before their countries had been discovered by Europeans, the extremely rough character of their stone tools would probably have led anthropologists to reject them as of human handiwork, or to assume that they were made by anthropoid apes. The search for evidence of man's existence before the drift-gravels of the present river-systems of Western Europe were deposited is at any rate justified by analogy, though how long before, zoology and anthropology must decide. What is quite certain is that the extreme rudeness of a chipped flint is not in itself a ground for its rejection as the work of man.

Case 99.

Objects from the palaeolithic area explored by Mr. Worthington G. Smith, at Caddington, near Luton, on the boundary between Hertfordshire and Bedfordshire.

Caddington stands upon the chalk, which is here capped with brick-earth and stony-clay; and in the brickyards (500 to 600 feet above ordnance datum) a gently undulating streak was observed from 4 to 13 feet below the surface. The discovery from time to time of flint implements on this line led to the conclusion that here was a level on which palaeolithic man lived and worked. In some cases two levels were noticed about 2 feet apart, and though these may have coalesced in other spots, there was a distinction in the mineral condition of the implements from these two horizons. The lower or true palaeolithic floor furnished specimens with a grey or indigo marbled surface, while those from the upper level were whitish, inclining more to those from the floor than to another series nearer the surface. The accompanying diagram shows the original land-surface A A full of narrow vertical fissures, perhaps made by the sun during a hot summer; these were filled up by brick-earth, brought down perhaps by a heavy storm of rain, and a new surface was formed at B B, on which level the whitish flint implements occur. Above this is contorted drift (see diagrams on *top shelf*), which also bears ochreous flint implements of much greater antiquity. These ochreous specimens are slightly abraded, and have evidently been transported by natural drainage

from a still higher position, where the earliest known inhabitants of these parts lived on a surface of chalk-with-flints, red clay-with-flints, and boulder clay. This was subsequently denuded, and formed a deposit several feet thick in the old valleys,—now the highest ground in the neighbourhood. Thus the uppermost layer of implements is the oldest of the three, and their mineral condition, which of itself would be an insufficient test of age, here agrees with the evidence of geology. The relative positions of the three beds also throw light on the periods of human occupation in this district. No implement

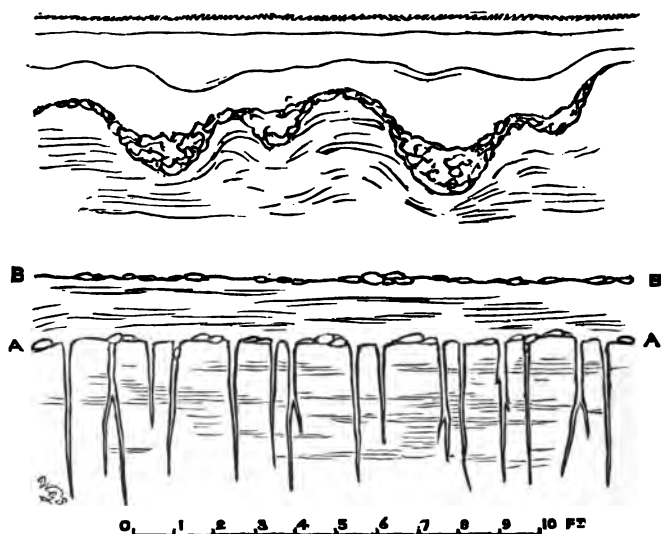


FIG. 2.—Section through palaeolithic land-surface at Caddington showing the "floor" in duplicate at A A, B B.

whatever has been found in undisturbed boulder-clay, and there is little to show how long after the epoch of maximum cold these implements were left on the old land surface of the higher ground; but the implements found in the lower layers were certainly manufactured before the deposition of the upper contorted drift, which doubtless indicates a period of cold at the end of the Ice Age.

An interesting corroboration of the sequence thus established is the occurrence of a re-chipped ochreous implement on the palaeolithic floor. This is a solitary instance, and it is evident that an old implement had been found by palaeolithic man in

the brown stony clay and re-pointed, only to be abandoned at the advance of flood-waters, which enveloped that and other human relics in a layer of brick-earth without shifting their position. It is this that gives a special interest to the discovery, for the heaps of raw material, the finished implements, the rough flakes, the cores and hammer-stones are found practically as palaeolithic man left them; and these remains show that there was at least on the lower or true palaeolithic floor a regular flint-working place. Hundreds of flakes have been fitted together again in their original positions, and in one case all that was missing of a large block was the centre, which, by pouring in plaster, was found to be of a form commonly met with among palaeolithic implements.

As the sequence in time of the three series of implements is fairly established, it may be noticed that the earliest contained no small scrapers, and closely resembled the ordinary ochreous specimens found in the drift gravels on the terraces of the Thames.

The implements from the palaeolithic floor, which were not rolled like the earlier ochreous specimens, and have thus retained their sharp edges, are of a more miscellaneous character, comprising pointed and oval forms, delicately chipped scrapers, hammer-stones and punches; but the most characteristic specimens are known as "side-scrapers," and resemble some from High Lodge, Mildenhall, generally known as the Moustier type.

To this latter period also belong the remains found on a similar palaeolithic level at Stoke Newington (see diagram at top of this case, and objects in Case 100), where man was living when the river Lea was 20 feet higher than at present, and flowed in a much flatter and more marshy valley. The higher ground flanking the river is capped with gravel which rests on the London clay, and is covered for the most part with the contorted drift which here and there has been denuded. Where the palaeolithic level thus crops up on the surface, entirely unabraded implements have been found; and this instance is enough to show that they were not made on the surface as we now see it.

The palaeolithic floor has been traced at Stamford Hill and Kingsland, in the City of London at 70 feet above ordnance datum, and at Highbury. The first implement from the floor was found in a river deposit at the 80-feet level, and 22 feet below the present surface. Many implements too have been found on the east bank of the Lea, though the palaeolithic floor has there been

pushed away by the contorted drift, or otherwise denuded. It may, however, have originally extended by outliers over the greater part of East Middlesex into Herts as far as Hertford and Ware, to Luton, Dunstable, Caddington and Hitchin, and possibly in patches on both sides of the Thames from Oxford to the Nore.

The palaeolithic site at Clapton belonged not to the Lea valley, but to that of the Thames, as is shown by the bedding of the river-deposits; and as a similar deposit of brick-earth occurs in the neighbourhood of Brixton and Clapham on the south, it is clear that at some time or other the river flowed over a valley 7 or 8 miles wide at this point. Between High-bury and Clapham, both of which at some period were on the actual banks, the valley is over 5 miles wide.

The floor itself consists of a layer of some 5 or 6 inches of sub-angular ochreous gravel, but in some places is only visible as a line of slightly contrasted colour. The gravel contains numerous unabraded implements and flakes, as well as bones of extinct animals in association with them (see Case 104). Below the floor, usually at a depth of 12 feet, is another bed of gravel, containing rolled fossil bones and abraded implements. Above the floor the contorted drift also contains implements, but these are all more or less abraded, and have been obviously brought from the north or north-west; but it must be remembered that even at Caddington (at 560 feet) and Dunstable (at 800 feet), where the ground falls again to the north and in other directions, the flints from the contorted drift were likewise rolled, and must have come from still higher ground that no longer exists.

It may be remarked that most of the implements belonging to the 12-feet gravel (below the floor) in the London district are found between the 50-feet and 100-feet contour lines of the ordnance maps, 70 to 75 feet being the most productive level. Above the 100-feet line, and below the 50-feet, examples from this gravel are somewhat rare; and this accords well with discoveries in the western suburbs. The high terrace gravels at Acton (50 to 100 feet above ordnance datum) produced implements which were wanting in the mid-terrace deposits; and the site of a palaeolithic flint-factory has also been discovered nearly 100 feet above ordnance datum at Acton, underlying the brick-earth, and about 6 feet from the present surface. Further discoveries may serve to indicate more clearly the area occupied by palaeolithic man in these parts, and the level of the land surface at that time, while the progress of geology tends to

render more trustworthy our estimate of the vast interval between that time and our own.

On the *main shelf*, at the back, are blocks of flint formed by replacing in their original position a number of flakes struck off during the manufacture of flint implements by primitive man. These all come from the palaeolithic level or floor at Caddington, and were found where they had been left by the flint-workers. In front may be noticed a hammer-stone bruised on one face, used in striking flakes from the core and held in the hand as shown in the figure (fig. 3); a flint implement, also from the palaeolithic floor, with a minute flake replaced, showing that the brick-earth was deposited with the least possible disturbance of the flakes lying on the original land-surface; and a piece of fossil antler, from Little Thurrock, Essex, which appears to have been cut by a flint implement, and bears an impression of a mollusc-shell now extinct in Britain, but found abundantly in a fossil state on the floor there. On a board are two flakes refitted together, one of them having been broken in palaeolithic times and the brick-earth still remaining in the fracture.

On the *slope* below the main shelf are two series of implements showing the contrast between the sharp white or marbled specimens from the palaeolithic level, and the water-worn ochreous implements of the contorted drift, subsequently brought down from higher ground but themselves of earlier date.

Bottom of case: Strings of fossils,



FIG. 3.—Mode of holding hammer-stone found at Caddington.

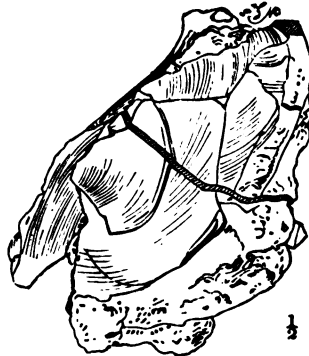


FIG. 4.—Flint broken in palaeolithic times, Caddington.

the *Coscinopora globularis*, possibly used as necklaces in palaeolithic times: the perforations are natural, but in some cases the orifice has been artificially enlarged. On two boards are flakes still incrustated with the brick-earth in which they are found at Caddington.

Cases 100, 101.

Implements found in the drift gravels of England, chiefly from the home counties.

Top slope: Palaeolithic implements of various types from Thetford and Broom Hill, Weeting, Norfolk, also from Santon Downham, Suffolk: these should be viewed in connection with other specimens from East Anglia in Case 103.

A series from Farnham, Surrey; and from Caversham, Oxon., where flat ovoid and other examples have been found in the terrace-gravels of the Thames nearly 60 feet above the river.

Second slope: To the left are several specimens from the palaeolithic floor at Stoke Newington Common, the depth from the present surface being there about 4 feet. The abundant fossil shells of land and fresh-water molluscs show this site to have been close to the margin of the Thames, when these implements were manufactured. Many are highly lustrous, and not water-worn; some exhibiting the curved edge mostly chipped on one side, that is so characteristic of the Mouster chopping tools.

Two other series of implements have been found in the same locality; and the following is their supposed sequence in time:—

(a) The oldest class, found only in the deepest pits from 12 to 40 feet deep in coarse gravel resting on the London clay. These are deeply ochreous or brown in colour, rude in make and greatly abraded, and no small scrapers or fine tools are found among them. They may be compared with a specimen from Canterbury, in Case 105 (fig. 13).

(b) Lustrous and slightly abraded implements of medium age, usually found in gravel at the 12-feet level, but sometimes much lower. Both pointed and ovate forms occur, and they are generally larger than those from the palaeolithic floor above them. The chipping is better than that seen on the ochreous examples, and scrapers are found, though somewhat rarely, on this level.

(c) Flints from the palaeolithic floor, retaining their sharp edges, and comprising pointed and oval weapons, and tools, a large number of scrapers, hammer stones, flakes and cores.

The contorted drift which covers the palaeolithic floor also contains implements, all more or less abraded, and many whitish or mottled in colour from long contact with the tenacious clay. These implements are not later than those on the "floor," as they have been brought down from higher ground to the north and north-west, being carried by slowly-moving half-frozen mud for 30 miles with a fall of at least 700 feet. As this contorted

drift contains the sweepings of the hills and valleys to the north it necessarily encloses palaeolithic implements of different ages.



FIG. 5.—Flint pick, Thames.

Other implements from north-east London are here shown; also specimens from the river gravel of the Brent at Hanwell, and the

upper terrace-gravel of the Thames at Acton, where in a bed 18 feet thick remains of the mammoth have been found. A fine pick (fig. 5) from the Thames should be compared with a French example in Case 108 (fig. 23).

Third slope: Specimens of various types from Kent. A famous locality is the sea-shore between Herne Bay and Reculver, where implements are often found at the foot of the cliff which have dropped from the gravels at the summit overlying the Lower Tertiary beds; they are more or less water-worn, according to the



FIG. 6.—Triangular implement, Herne Bay.

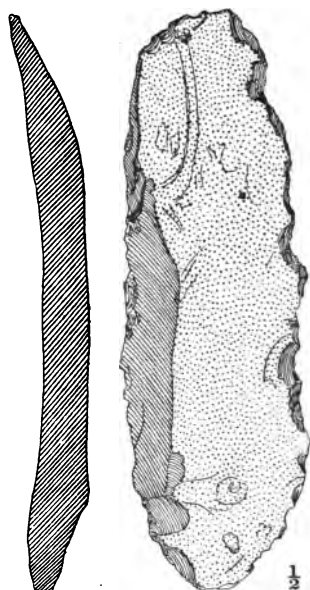


FIG. 7.—Worked flake, Northfleet, Kent.

time they have been exposed to the action of the waves. One which is triangular in form is here figured (fig. 6), also a large worked flake (fig. 7) and a shoe-shaped implement from Northfleet, Kent (fig. 8).

Bottom slope: A number of specimens from Reculver and others from the gravel at Milton Street, near Sittingbourne, 100 feet above the Thames; in one of the pits in this neighbourhood was found the Galley Hill skeleton, which has been referred by some to the palaeolithic age.

Case 102.

Top slope: A series of chert implements from Broom in the Axe valley between Dorset and Devon: the material is a flinty chert which was seldom used for the purpose in districts where flint was abundant; similar specimens from Brittany, where the chalk does not occur, may be seen in **Case 108**.

Second slope: Flint implements from Biddenham, Bedfordshire,

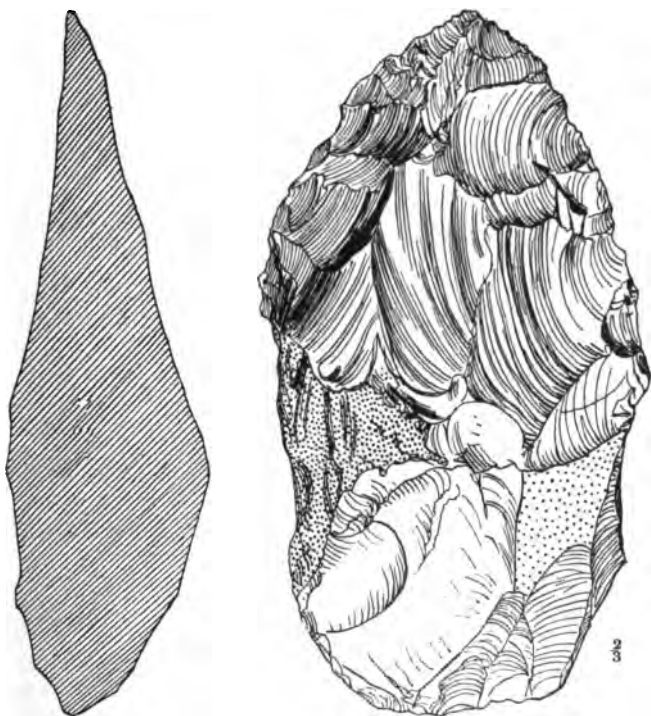


FIG. 8.—Shoe-shaped implement, Northfleet.

where the drift-gravel forms a capping to a low hill about two miles long, the surface being 60 feet above the river Ouse: remains of the cave-bear, reindeer, stag, urus, aurochs, hippopotamus, woolly and slender rhinoceros, the straight-tusked elephant, mammoth, horse and cave-hyaena occurring in the gravel. Some of the implements are very massive, and the series includes some of unusual form. In the front are ochreous flints from Kempston, in the same county, one at least of which is remarkable as showing two

distinct periods of flaking in palaeolithic times. In fig. 9 the crust of the original pebble is seen towards the butt-end, and the surface of the implement, as first chipped, at B: subsequent contact with the brown gravel of the drift has stained this surface, which contrasts strongly with the flaking D done at some later date; and the extent F to which the flint has been thus affected is shown by the different colour of a recent fracture E at the tip of the specimen.

Third slope: Implements from the neighbourhood of the Solent, among them an interesting series from Shirley, by Southampton Common, and several flat oval specimens from Hill Head, on the east of Southampton Water, which have been much water-worn, possibly in modern times, as they have evidently come from a capping of gravel on a low cliff of Bracklesham sands.

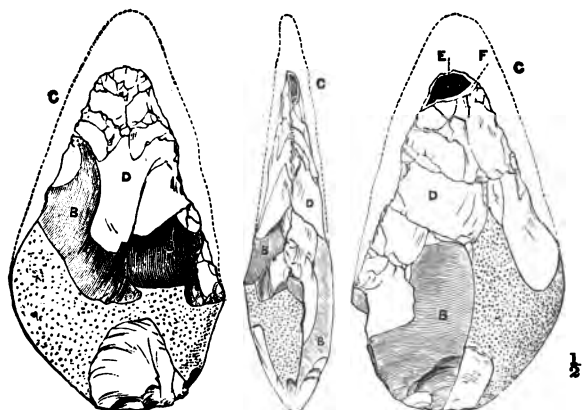


FIG. 9.—Re-pointed implement, Kempston, Beds.

Bottom slope: Implements from the neighbourhood of Salisbury, where discoveries have been made both in the high-level gravels at Bemerton and the lower beds, principally of brick-earth, at Fisherton. The summit of Milford Hill is about 100 feet above the Avon, and is covered with a deposit of gravel about 12 feet thick. Specimens have also been found along the coast further westward, as at Lymington, Boscombe and Bournemouth, the gravels which cap the cliff for some distance east of Hengistbury Head being supposed to have lined the valley of a river that is now represented by the Solent.

A few specimens of dark lustrous flint are of special interest as coming from the first site on which palaeolithic implements were collected. The diggings at Hoxne in 1797 showed that the gravel, in which bones of extinct animals also occurred, was about 12 feet from the surface, below a considerable thickness of brick-

earth. The Hoxne specimens should be compared with others from East Anglia in the adjoining case.

Case 103.

Top slope: Implements with white crust from the chalky district of Dorset; a series showing good workmanship from Hitchin, on the northern border of Hertfordshire; and an example in quartzite from the Lizard, Cornwall.

Second slope: Diagrams showing the terraces formed on the sides of a valley by erosion of the river-bed; and the respective levels at which flint implements and bones of extinct mammals were found on the old bank of the Thames to the west of London.

The rest of the case is filled with examples of various types from the eastern counties. In the valley of the Lark the principal sites are Bury St. Edmunds, Icklingham, Warren Hill, and Mildenhall, specimens from all of which are shown, those from the last-named locality including some characteristic examples of the Moustier type. The cutting edge of this type is curved, and is at times almost semicircular, while the chipping is mainly confined to one face, the other being more or less flat as struck off from the core (see fig. 19 and examples in Case 106).

From the river basin of the Little Ouse, a remarkably large implement (length $11\frac{1}{2}$ in., weight 5 lb. 7 oz.) found at Thetford should be noticed; also some massive specimens from Feltwell. At Santon Downham hundreds of implements have been found, including some of the best specimens of palaeolithic flint-work hitherto discovered; and the series contains some interesting examples of the disc type (fig. 10), and another implement, with a speckled surface, has the edges curved like the blade of a screw-propeller (as fig. 14). Implement-bearing gravels have also been found at Brandon and Wangford, the former place being celebrated as the principal seat of the gun-flint manufacture still carried on in this country. To this river basin also belong specimens from Broom Hill, Weeting, shown in Cases 100, 101.



FIG. 10.—Flint disc, Santon Downham.

Case 104.

A small series of natural history specimens is here shown to illustrate the Drift period. The lower jaw of a young mammoth was dredged off the Suffolk coast, and belongs to the period when the North Sea did not exist, a continuous land-surface stretching from Scandinavia to the 100-fathom line on the west of Scotland and Ireland (see map in Case 105). A molar and part of a tusk of the mammoth are also shown, the latter found with flint implements at Bedford. The earlier form of elephant (*antiquus*, also called "straight-tusked"), a survival from the Tertiary period, is represented by a molar and the tip of a tusk, both from Little Thurrock, Essex, where the palaeolithic "floor" has been traced.

Below, in a box, are exhibited some interesting relics of the Drift period, showing the co-existence of man and the mammoth: a shoulder blade of the latter was found as now arranged on the palaeolithic level at Lower Clapton, with a well formed flint implement resting on it. At the back are two artificially-pointed stakes of birch from the site on Stoke Newington Common; and at the sides of the case are two massive blocks of flint probably used by palaeolithic man as anvils in the manufacture of implements; one of them is 2 feet in length, weighs thirty-two pounds and was found near Isleworth.

Case 105.

Various implements of special interest are here shown together, the ordinary types having been arranged according to localities in the preceding cases. The historical implement (pl. 2) discovered at the end of the seventeenth century with bones of some species of elephant near Gray's Inn Lane, on what was formerly the river's edge, was recognised as a piece of human handiwork, and may fairly claim to be the first of its kind recorded in this or any other country. The Dallow Farm implement (fig. 11) was found in 1830, seventeen years before the important discoveries in the Somme valley by M Boucher de Perthes, whose portrait is shown in this case

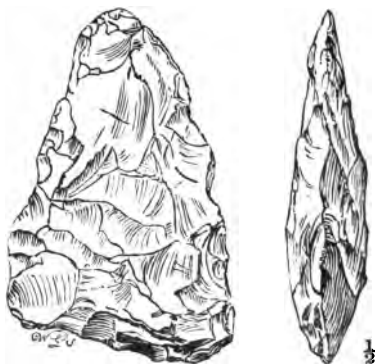


FIG. 11.—Implement found in 1830 at Dallow Farm, Luton.

Some flakes found at Stoke Newington Common and struck off by palaeolithic man from the same core are here shown fitted



FIG. 12.—Chopping tool, Stoke Newington.

together again, as evidence that the manufacture of flint implements took place on this site, and that very little disturbance

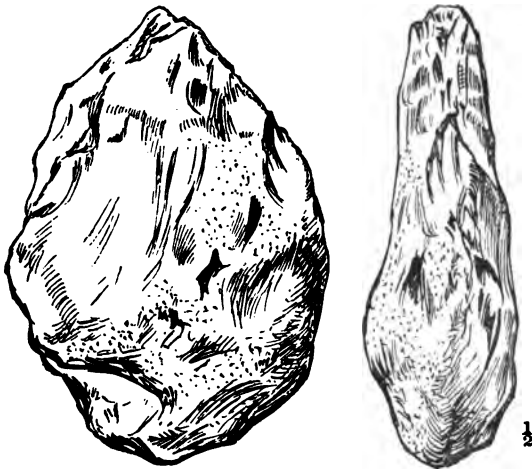


FIG. 13.—Rolled implement of the oldest class, Canterbury.

of the surface occurred when the upper strata were deposited. On the same shelf should be noticed a large chopping tool from Stoke Newington, which is well adapted to the hand, as shown

(fig. 12); an implement from the same locality made of quartzite, a material that was very rarely used in this part of the country; a much-rolled flat oval specimen from Canterbury (fig. 13), which illustrates the condition in which the oldest implements were found below the palaeolithic floor (see above, p. 16); and a blackish-grey flint (fig. 14), found near the surface in Drury Lane; perhaps of the same date as many similar examples found above the contorted drift in N.E. London and referred to "mesolithic" times, that is, to the interval between the older and newer periods of stone.

A coloured map shows the extent of land in north-west Europe during some part of the palaeolithic period, when the 100-fathom line marked the eastern shore of the Atlantic and neither the North Sea nor the English Channel existed. A table of stratified rocks is also exhibited

here, but it is only from the Quaternary (Pleistocene and Recent) beds that the present collection is derived, and the red line marks the geological period of man's first appearance, according to the views most widely accepted by science. In the adjoining case, however, is a series of chipped flints on which have been based arguments to show that a very much earlier date must be assigned to the human race.

Below should be noticed a number of flint implements recently discovered in Savernake Forest, Wilts. Some of these have a remarkable glassy surface, which is not altogether confined to the worked parts or even the worked flints, but extend over the crust on some specimens, and may possibly be due to a solution of silica deposited after the flints had been embedded in the gravel: it is not therefore connected with the manufacture of the implements.

A chert implement from Broom (see Case 102) is shown here so that the curving edges may be noticed. The dotted line (fig. 15) indicates the direction of the opposite edge, the outline of the implement not being in the same plane. This is not an unusual feature in drift-implements, but the curve is almost without exception in the form of 2 and not S.

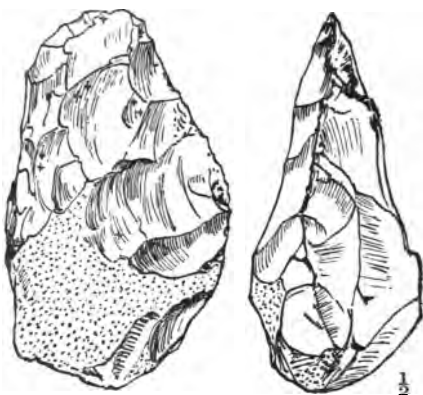


FIG. 14.—"Mesolithic" implement, Drury Lane.

Case 106.

The upper part of this case is occupied by a representative series of worked flints known as eoliths, and regarded by some investigators as evidence of man's presence here before the present river-system was formed. On the summit of the chalk Downs of south-east England occur patches of drift-gravel that must have been carried by natural agencies from higher ground in the neighbourhood, and this can only have been done before the Weald district had been denuded below the level of the North and South Downs. The inclination of the strata, as shown by the diagram in the case, is sufficient evidence that the chalk was elevated about 2500 feet above the present surface of the Weald clay, the strata having since been denuded to the following respective depths: chalk, 1000 feet; upper greensand, 80 feet; gault, 100 feet; lower greensand, 600 feet; and (where the Hastings sand comes to the surface) Weald clay, 750 feet. It was during this process that chert from the outcrop of the lower greensand was washed down on to the present plateau, where rolled pebbles of that formation are now found in the gravel along with eolithic flints; and as the summit of the chalk downs is now from 400 to 800 feet above the sea, it is evident that these gravel deposits date back to a very remote period, when rivers flowed north and south from the watershed, at least 400 feet above their present level, and to a certain extent in a different direction, for the greensand and Thames valleys marked A A' (fig. 16) were excavated in the glacial period. The eolithic flints seem to be closely associated with the plateau gravel and to be confined to the area over which it extends; while their rude workmanship accords well with the early date assigned to them. The three specimens figured may be regarded as typical, and are called "natural flint slightly

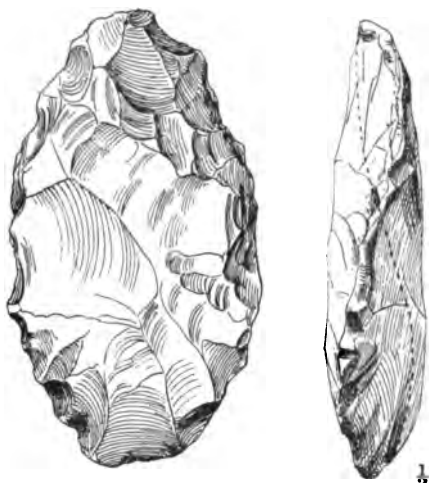
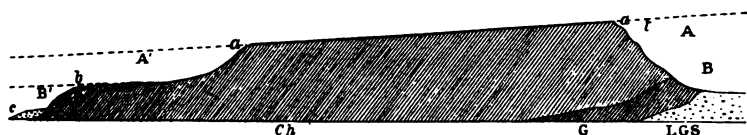


FIG. 15.—Chert implement with curved edges, Broom, Dorset.

trimmed at the edges" (fig. 17); "beak-shaped implement" (fig. 18); and "double scraper, long variety" (fig. 19). Some of the forms here exhibited present a certain resemblance to

FIG. 16.—SECTION OF NORTH DOWNS, SHOWING RELATIVE POSITIONS OF PLATEAU AND RIVER DRIFT.



- a.* Red clay drift, 5 to 20 ft. thick, with unrolled flints from chalk, overlying thin patches of lower eocene and pliocene beds. On the surface are found eoliths, and fragments of chert and ragstone from the lower greensand outcrop.
b. High-level river-gravel, about 100 ft. above the Thames.
c. Low-level river-gravel and loam, sloping down to the Thames.
Ch. Chalk. *G.* Upper greensand and gault. *LGS.* Lower greensand.
AA'. Major valleys of glacial period. *BB'.* Later valleys.

the ordinary river-drift type, but the latter is but rarely represented in the plateau gravel by well-chipped and unmistakable specimens, the proportion being about 6 per cent. of the whole

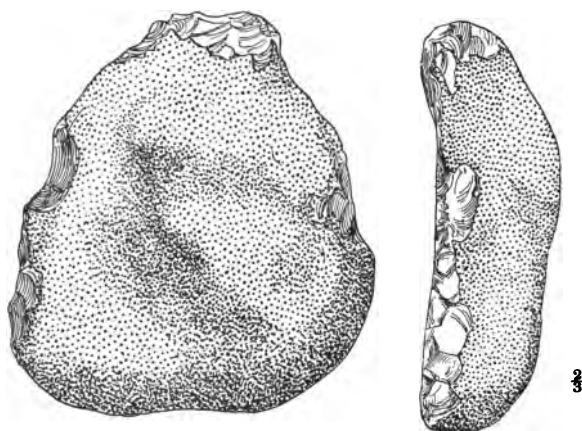


FIG. 17.—Eolithic flint with trimmed edges.

number discovered; while there are 40 per cent. of slightly worked flints, and 54 per cent. rude implements. These remarks apply more particularly to the implements shown in this case, which were collected by Mr. Benjamin Harrison on the North Downs

of Kent, in the neighbourhood of Ightham, but similar discoveries



FIG. 18.—Beak-shaped eolithhic implement.

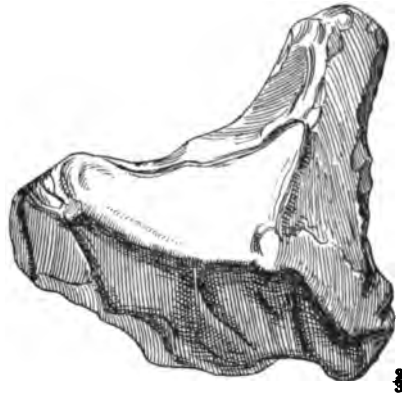


FIG. 19.—Eolithhic double-scraper, Kent plateau.

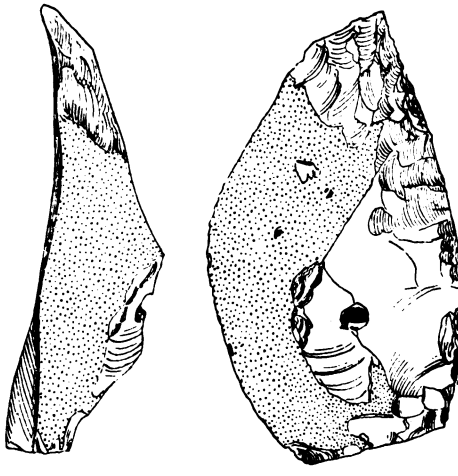


FIG. 20.—Le Moustier type of implement, High Lodge, Mildenhall.

have been made on the southern range near Eastbourne, Sussex

in Hampshire; near Salisbury, Wilts; and in the southern part of Essex.

In the *lower part* of this case are arranged several examples from the eastern counties of the Moustier type of implements (figs. 20 and 21), marked by a more or less curved cutting edge

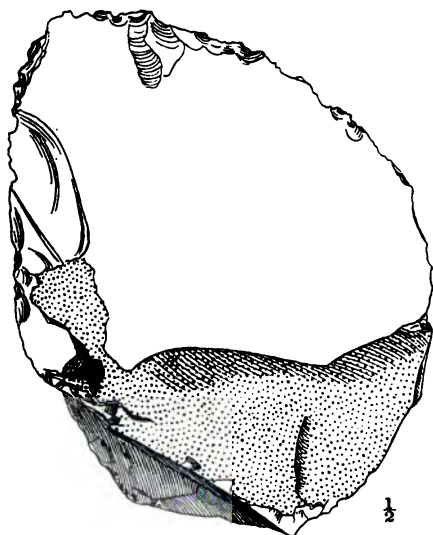


FIG. 21.—Side-scraper, Suffolk.



FIG. 22.—Large flint implement, St. Acheul.

at one side (hence often called side-scrapers) and chipped for the most part on one face only. The chief locality is High Lodge, Mildenhall, Suffolk, but specimens are found elsewhere, as in north-east London, and the peculiar form suggests some connection between palaeolithic man of these levels and the oldest cave men of southern France (see p. 39).

FRENCH RIVER-DRIFT SERIES.**Cases 107, 108.**

The two upper slopes, as well as the bottom of these Cases and of Nos. 109, 110, are occupied by a collection from the famous site



Fig. 23.—Flint pick,
St. Acheul.



Fig. 24.—Re-chipped flint implement,
St. Acheul.

of St. Acheul, near Amiens (Somme). The plateau rises about 90 feet above the river, and shows in section beds 20-30 feet thick

resting on an irregular surface of chalk. The implements generally occur in the lower gravel, near the chalk, where also the greater number of bones (see specimens on *top slope*) are found, the upper strata being destitute of organic remains to the depth of 12-14 feet, except for a number of Gallo-Roman interments which show that the surface has hardly altered during the last eighteen centuries.

St. Acheul has given its name to a type of implement considered by some to be intermediate between the Chelles specimens and those from the cave of Le Moustier; but the worked flints

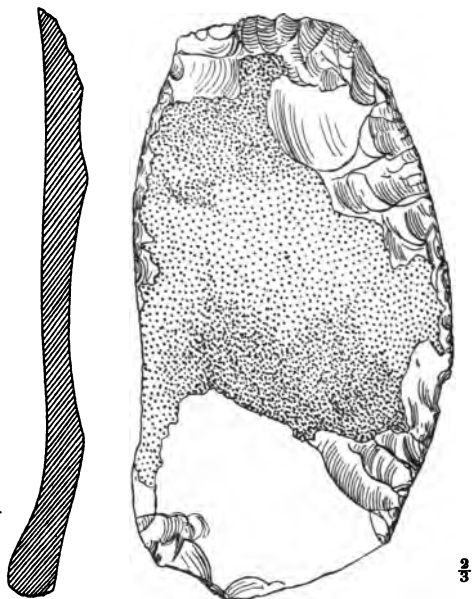


FIG. 25.—Flint knife, Montiers, Somme.

of these beds are by no means of uniform shape or size. One of the larger specimens is here figured (fig. 22), and two others should be compared with English examples; a large pick (fig. 23), with one from the Thames (fig. 5), and a large derived implement (fig. 24) chipped at various periods (as shown by the different staining) resembles a Bedford specimen in Case 102.

On the *third slope*, a small series from Bois du Rocher (Côtes-du-Nord), shows the material employed in a district where flint does not naturally occur: there seems to have been a workshop here in palaeolithic times, two kinds of cherty stone being quarried on the spot. At Vaudricourt, Pas-de-Calais, implements have been found in ancient alluvium with bones of elephants. Three specimens

are shown from the famous site of Chelles, Seine-et-Marne (see

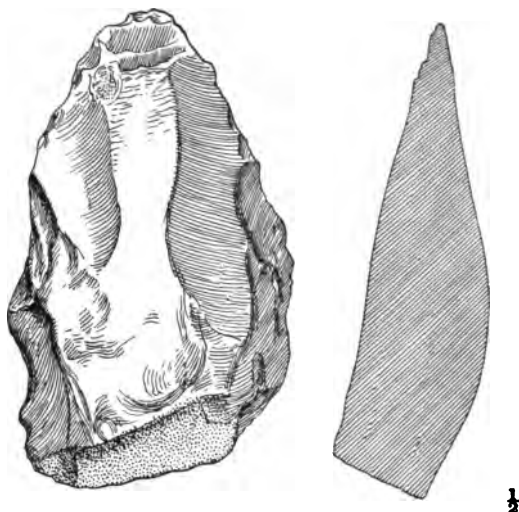


FIG. 26.—Chert implement, San Isidro, Madrid.



FIG. 27.—Triangular implement, Coussay-les-Bois, Vienne.



FIG. 28.—Oval implement, Coussay-les-Bois, Vienne.

p. 3), which is said to have furnished the oldest examples from the river-drift. Among the flints from the low-lying sand-pits at

Montiers, Somme, should be noticed several broad polygonal flakes, common on this site but rarer in England. A good specimen of the flake-knife is illustrated (fig. 25).

On the *bottom slope*, to the right, are examples from Marboué (Eure-et-Loir), one being of more than average size.

Cases 109, 110.

On the *second slope* are a few chert implements from the province of Poitou; and an interesting series presented by M. Boucher de Perthes, found by himself in the quaternary gravels of Abbeville, the principal sites outside the town being the village of Menchecourt, the Champ de Mars, the Moulin Quignon, St. Gilles, and Mautort. In one or other of the pits the occurrence of flint implements in association with bones of the mammoth, woolly rhinoceros, horse, urus, reindeer, cave-lion, and cave-hyaena has been placed beyond doubt, while the good preservation of delicate shells in the same levels shows that there has been no disturbance since these beds were laid down by running water. It may be added that the deposits at Menchecourt closely resemble those at Fisherton, near Salisbury (see Case 102), and yielded implements at levels 40–50 feet above the sea. At Moulin Quignon, they occurred at about 100 feet, and higher still at Mareuil.



FIG. 29.—Chopping tool, Poitou.

A small series from San Isidro came from a well-ascertained palaeolithic level on the right bank of the river Manzanares, south-west of Madrid. A small plateau here is about 140 feet above the river, and it was in the drift resting immediately on the tertiary beds that the implements were found, while bones of *Elephas*

meridionalis, hippopotamus and rhinoceros were generally on a higher level. The implements are roughly chipped in a cherty flint (fig. 26). On the same shelf is a specimen from Cerveteri, on the coast of Italy, half way between Rome and Civitavecchia.

The *third slope* contains a series of worked flakes from sand-pits on the low-level at Le Pecq, near St. Germain-en-Laye, west of Paris. Here occurred a few drift-type implements which had evidently been much rolled and showed various degrees of discoloration on the chipped surfaces. An interesting collection from Coussay-les-Bois, and other sites in the neighbourhood of Vienne, province of Poitou, contains good examples of the flat triangular type (fig. 27) and the flattened oval (fig. 28), while from the same district come some heavier chopping tools of a deep-brown colour (fig. 29).

[There are exhibited at the **Natural History Museum**, in the Department of Geology and Palaeontology, the original eoliths specimens figured by Sir Joseph Prestwich in *Controverted questions of Geology*; and the descriptive names given by him to the various forms are furnished on the labels. His collection of flint implements, including a large number of the ordinary drift type, was presented to the museum by his widow; and a certain portion is exhibited in a cabinet at South Kensington. In an adjoining Table-Case is a series of flint implements chiefly from Milton Street, Kent, discovered and presented by Mr. F. C. J. Spurrell. Some of the specimens were obtained from various patches of gravel occurring between Bexley and Gravesend, and belonging to the deposit known as the Dartford gravel, which lies between 80 and 150 feet above the sea-level. The same donor has added to the collection part of the lower jaw of a woolly rhinoceros found lying on a heap of flint chips, one of which still adheres to the bone. This discovery of the site of a palaeolithic workshop at Crayford is of special interest, and should be studied in connection with the palaeolithic floor north of the Thames. The site was on an old bank of the river two miles from the present bed, and in front of a chalk cliff against which successive floods had deposited layers of brick-earth and sand. The flint refuse was at least 36 feet from the present surface, and some re-constituted blocks are exhibited to show the manner in which flakes were struck off in the manufacture of implements.]

FOREIGN BONE-CAVES.

THE occurrence of man's handiwork in the drift-gravels has already been discussed; but a more conclusive proof of the contemporaneous existence of man and the mammals of the Quaternary or Pleistocene beds is found in the caves of England, France, and Belgium. The earlier researches of geologists in these ancient habitations had been undertaken chiefly for the purpose of adding to our knowledge of the extinct mammals, without any idea of man having been their contemporary. The fact that the mammoth, the cave-bear, woolly rhinoceros, and other animals now extinct, had lived in these latitudes was amply proved, but the indications of man's existence were little observed because they were not expected; and when they did occur, the evidence was disregarded even by scientific men of the first rank. There can indeed be little doubt that in these investigations much evidence for the co-existence of man was unwittingly destroyed.

The Gallenreuth caves in Franconia were explored in 1774 and 1820, and the co-existence of man and the extinct animals ascertained; but the discoveries by Dr. Schmerling in the caves of Liège about 1832 perhaps did more than any others on the Continent to draw the attention of the scientific world to these momentous facts. In the forty caves examined, he met with very few human bones, but a large number of flint implements and flakes which were rightly attributed by him to human agency; and since his day many scientific investigators have accumulated evidence from a great number of sites, ranging from Gibraltar and Sicily to Switzerland and Brittany. It is, however, in France that the most important and interesting explorations have been conducted, and a representative collection excavated in the caverns of the Dordogne by Mr. Henry Christy and M. Edouard Lartet is here exhibited.

The cavern-abodes of palaeolithic man are all of natural formation, but may be arranged in classes according to their geological history. The majority consist of recesses in limestone rock either produced by the erosive action of a river which has created a valley outside the entrance, or by subterranean streams that have found their way to the river through natural fissures in the rock, or have themselves formed a passage by the

action of the carbonic acid contained in rain-water. In some cases the lowest strata of a cliff are wasted horizontally by water and frost, and leave behind a kind of pent-house that would afford shelter to a primitive population. In other cases deeper and isolated recesses are formed by the same means, but still consist of a single chamber with a comparatively large opening, while the action of subterranean streams due to drainage from a higher level generally produces long winding galleries that radiate in several directions and on different levels. This last is the most common form of cave dwelling in this country, but examples of all kinds are found in France and other parts of Western Europe.

Caverns of palaeolithic date are to a large extent filled up with silt deposited either by drainage from above or by floods in the valley, on the slopes of which they are often found. The formation of stalactite and stalagmite is familiar; and it is by this means that the accumulations introduced by man and beast during successive ages have extended our knowledge of those remote times. Once the entrances were blocked, the bone-caves became practically inaccessible, and the floor was preserved from disturbance during the formation of the breccia which in many cases has sealed up the early deposits till recent times.

A reference to the sketches in Cases 111, 112, will show that some of the palaeolithic caves are now high above the water-level, the entrances being visible on the face of the cliff sometimes (as at Les Eyzies) as much as one hundred feet above the river. That such cave-dwellings were easily accessible from the river banks in palaeolithic times may be assumed, especially as they were evidently flooded at times by the swollen waters of the valley. But there is not always such a difference in the water-level; for instance, at La Madelaine, the rock shelter is but little higher than an extraordinary flood at the present day. Though the excavation of a valley to a vertical depth of one hundred feet would in any case require an enormous period of time, yet it must be borne in mind that the volume of the rivers in this part of the world during the glacial period was very much greater than at present (see above, p. 4); and no arithmetical calculations based on the present erosive power of a river can afford a trustworthy chronology for palaeolithic times. So far from being measured by years, the period now under discussion cannot even be accurately defined by the gradual changes of climate; for both fauna and flora are mixed to a perplexing degree.

The fauna shows diversities of habit that can only be

explained by considerable variations of climate, or by remarkable powers of adaptation to extreme temperatures. All the species that occur in the river-gravels are also represented in the deposits of our bone-caves, with the single exception of the musk-sheep (see list on p. 5); and though a bear's skull nearly 2 feet long may be regarded as exceptional, it is clear that such animals as the cave-lion were on the whole larger than their modern representatives. The difficulty in supposing all these animals to have been living in the same district at the same time has been fully recognised, and various explanations have been suggested. Some of these will be briefly noticed presently, but it may be useful to give here the prehistoric fauna of north-west Europe arranged according to climate, inasmuch as the classification generally accepted for the French caves proceeds on the hypothesis that the cave period was on the whole marked by a gradual change from almost tropical to arctic conditions. What may be called the southern group comprises the lion, the spotted and striped hyaenas, the hippopotamus and the African elephant; while a decidedly cold climate or a considerable altitude was necessary for such animals as the reindeer, glutton, pouched marmot, hamster, Alpine hare, lemming, ibex and chamois. Remains of the following temperate group have been found in caves either in England or France:—beaver, hare, rabbit, porcupine, wild-cat, marten, stoat, otter, brown and grizzly bears, horse, bison, urus, saiga antelope, stag, roe, fallow deer and wild boar.

The mildness of the climate in this part of the world during the pliocene age is indicated by the fauna and flora of the forest-bed which underlies the boulder clay on the shores of Norfolk and Suffolk. A gradual lowering of temperature would account for the arrival here, before the formation of the English Channel, of species from other parts of the continent; and the pliocene mammals would be gradually supplanted by immigrants adapted to a colder climate. The change was only effected very slowly and during an enormous period, nor was its progress at all uniform, as species belonging to all three groups are often found associated. In fact, they have on several occasions been found together under conditions that leave no doubt that these mixed species belong to the same area and the same period. Bones of old and young mammals, and even of birds, have been found in their natural positions, showing that the animals had died on or near the spot and had not belonged to an earlier deposit that had been subsequently disturbed. More especially are the molluscs distributed in the

same paradoxical manner as the birds and mammals, and the plants afford independent evidence that species now living under different climatic conditions were closely associated in palaeolithic times.

It is, however, possible that seasonal migrations may have spared the reindeer the summer heats of southern France, and enabled the hippopotamus to escape the ice-bound rivers of a northern winter. This explanation though far from adequate, may be regarded as an improvement on the attempt to solve the problem by supposing a constant alternation of hot and cold periods—a view that has been put forward with considerable ingenuity, but is now generally discarded both by English and Continental geologists.

No detailed consideration can here be given of the powers possessed by many animals in a wild state, as well as in captivity, of adapting themselves to changes of climate. A few instances may, however, be adduced to show that no hard and fast line can be drawn between tropical and cold temperate animals. To the present day the tiger with a thick woolly coat hunts the reindeer in Manchuria; while the lion thrives in the cold atmosphere of the upper Atlas range, and in the time of Herodotus must have been plentiful in Thrace. The spotted hyaena is found at an altitude of five thousand feet in the mountains of Abyssinia, and the camel survives the icy blasts of the Tibetan plateau; while the hippopotamus will still take to the water in frosty weather. This is enough to show that certain animals classed as tropical are able to bear a considerable degree of cold; and while their presence in north-west Europe during a cold period is to some extent explained by such considerations, the abnormal southern range of sub-arctic forms may be in part accounted for by the extension, over what would have been their natural feeding grounds, of glaciers such as now render the greater part of Greenland practically inaccessible.

That man lived among such diverse forms of animal and vegetable life is amply proved by the discovery of his handiwork associated with their remains in undisturbed geological beds; but his weapons and implements are infinitely more numerous and better authenticated than most of the skulls and other portions of the human skeleton attributed to palaeolithic man. Among the many discoveries of this kind on the Continent, there are, at any rate, some that convey an impression of the physical and mental characteristics of the earliest type of man known to have existed. The most instructive portion of the skeleton, the skull, has been often found in bone-caves on the Continent; the most famous example being the Neanderthal specimen,

discovered not far from Düsseldorf, in Rhenish Prussia. Its extraordinary appearance led some eminent scientists to regard it as a deformed specimen; but subsequent discoveries in the caves of Eguisheim (near Colmar, Alsace), Brûx (Bohemia), and Spy (Namur, Belgium) have shown that the Neanderthal skull is only an exaggerated form of a type that is characterised by remarkably thick and prominent eye-brow ridges, a low crown, and a low sloping forehead. This type has received a name from a specimen found as long ago as 1700 at Cannstadt (Württemberg); but the circumstances of this and many other discoveries of more recent date are not perfectly ascertained. A series of casts in the Department of Geology and Palaeontology, Natural History Museum, South Kensington, may be studied with advantage. The capacity, however, of the brain pan is not less than that of an average Polynesian or Hottentot skull; and though as a truly human skull it is the nearest approach to that of a man-like ape yet discovered, comparison with the skull of a gorilla will show many important points of difference between them.

The collections here described consist of the remains of human handiwork, and it is in accordance with certain predominant forms observed in the flint and other implements of the cave-period that French archaeologists have elaborated the following chronological table, which is widely recognised as a convenient division of types, though the sequence has been disputed. The climatic changes are based mainly on the fauna found in the different caves or on various levels of the same cave; and the cave-remains are regarded as later than the river-drift implements of the Chelles and St. Acheul types already dealt with (see p. 9).

| Typical Sites in Ascending Order. | Climate. | Contemporary Fauna. |
|--------------------------------------|----------------|--|
| Le Moustier (Peyzac, Dordogne). | Cold and damp. | Mammoth, woolly rhinoceros, cave-bear, and musk sheep or ox. |
| Solutré (Saône-et-Loire). | Mild and dry. | Horse abundant, reindeer, mammoth; no remains of rhinoceros. |
| La Madelaine (Tursac, Dordogne). | Cold and dry. | Laugerie-Basse race of man; great development of northern fauna, as the reindeer. Extinction of the mammoth. |

Cases 111, 112.

Antiquities from palaeolithic cave-dwellings in France, which are generally supposed to have been inhabited after the disappearance of those more primitive peoples whose implements are found in the drift-gravels of the rivers. On the *top shelf*, at the back, are arranged specimens of flint from Bruniquel (Tarn-et-Garonne), which should be viewed in connection with Cases 114, 115; and a board containing bone and horn objects, as well as a string of periwinkle shells (*Littorina littorea*) from the cave at Cro-Magnon: worked bones are not found in the earliest cave-deposits.

On the *second* and *third shelves* are placed, at the back, boards containing flint implements from various cave-dwellings, arranged as far as possible in chronological order: the earliest being Le Moustier.

The cavern called **Le Moustier** is on the right bank of the Vézère, about a furlong from the river, at an elevation of 90 feet (see lithograph in Case 118). The level of human occupation in palaeolithic times had been covered to the depth of 5 or 6 feet by earth, which filled the cave to the roof; and the excavations carried on by Messrs. Lartet and Christy in 1863 brought to light remains of an earlier type than any yet discovered in caves, but showing some advance on the civilisation of the drift period. The characteristic implements of flint are mostly chipped on one face only, and have a curved cutting-edge, opposite which is generally a portion of the original crust to serve as a grip (fig. 30): these implements are occasionally found in the river-gravels of this country (see specimens from Stoke Newington, Case 100, and Suffolk, Case 108), as well as in France; while many examples of the river-drift type also occur in the cave at Le Moustier (fig. 31).

The typical site of the second cave-period is **Solutré**, in the department Saône-et-Loire. The **Cros (Clos)-du-Charnier**, as the site is called from the enormous number of bones discovered, is situated on a small plateau at the base of a limestone escarpment, and unlike most palaeolithic sites, was an open air settlement, sheltered to some extent on the north by the cliff. Remains of various stages of the palaeolithic period are here found over a very small area, and though the predominant type of flint implements (the leaf-shaped lance-head, as fig. 33) is distinct enough for purposes of classification, the site is in some ways not so typical as Laugerie-Haute, which has been adopted by some authorities. Several landslips have occurred on this spot, but the relative position of the palaeolithic layers is said to have been unaltered; there are mounds of kitchen refuse, reindeer bones, and flint implements, but especially burnt bones of the horse, which form

walls or ramparts: horse-bones also occur in large quantities around and underneath prehistoric fire-places, most of which are surmounted by interments of unburnt or partially-burnt human bodies. The evidence available points to the conclusion that the hearths, the refuse-heaps, the bone-walls and the interments with or without the slabs of limestone are all connected and may be referred to the same people and the same period, but the character of the flint-working has been held by some to point to a transition period between the palaeolithic and neolithic civilisations. The similarity of the leaf-shaped implements to specimens from Ireland (plates 9 and 10) and elsewhere lend some colour to the suggestion. On the other hand, the fauna consists of the



FIG. 30.—Chopping tool,
Le Moustier.

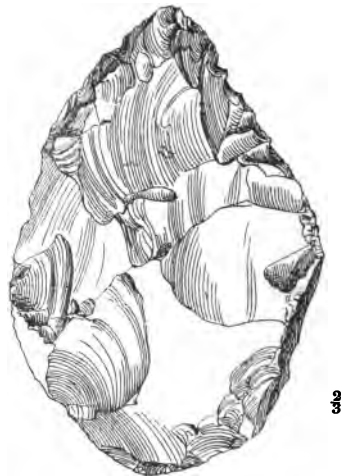


FIG. 31.—Implement of drift
type, Le Moustier.

horse, reindeer and mammoth, deer, urus, fox, wolf, saiga antelope, and cave-lion, but the great carnivores only occur in the stratum below the fire-places, and the wild boar and rhinoceros do not occur at all.

Laugerie Haute is in many respects a more suitable type-locality than Solutré, as the remains are more homogeneous, and were found underlying a Madelaine deposit. Flint working had by this time reached a high pitch of excellence, only to be surpassed in the neolithic age; and the most characteristic form of the period is the leaf-shaped point (figs. 32 and 33), which may have been used, according to size, as an arrow-head, lance-head, or even a knife. The flint-flakes used for scraping skins and other purposes were also finely worked and had acquired a definite

form (fig. 34), rounded at one or at both ends by careful chipping on one face only. The double scrapers are also common in the succeeding Madelaine period, when the single ones were formed out of longer flakes.

The cave or rock-shelter of **Cro-Magnon** is situated in the limestone cliff overlooking the valley of the Vézère, near Tayac, Dordogne; and was discovered in 1868 during the construction of the railway. Five skeletons were found by the labourers, but only three were preserved; casts of the skulls are shown on *third shelf*, and are those of an old man, a male adult, and a woman who had been seriously but not fatally wounded on the forehead



FIG. 32.—Leaf-shaped point, Laugerie Haute.



FIG. 33.—Leaf-shaped point, Laugerie Haute.

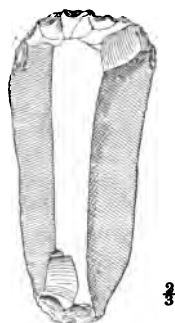


FIG. 34.—Flint scraper, Laugerie Haute.

by a blow from a cutting instrument. The bodies had not been buried, but lay on the floor of the shelter, which was at that time only about four feet from the overhanging rock. It had been raised to this level by successive accumulations of *débris* separating the layers of charcoal and hearthstones that show human occupation at intervals. The palaeolithic date of the skeletons has been disputed, but as *débris* to the depth of 15 or 20 feet has accumulated above the rock-ledge since the bodies were deposited below it, there is sufficient evidence for a very remote date of occupation. Physically these remains are of interest as showing that what is known as the Cro-Magnon race had large as well as very long heads (the mean cephalic index is 73·41: see p. 73); and the

cranial capacity of the woman surpasses the average capacity of male skulls of to-day. In stature they were also above the modern average, the old man being upwards of 6 feet in height ; but there are also indications, in the projecting lower jaw and broad face, of a low state of development, and the somewhat mongoloid features which have been traced in many of the French cases as well as in other parts of western Europe have been supposed to point to some affinity with the Eskimo or the Basques of the Pyrenees.

With the human remains at Cro-Magnon were found about

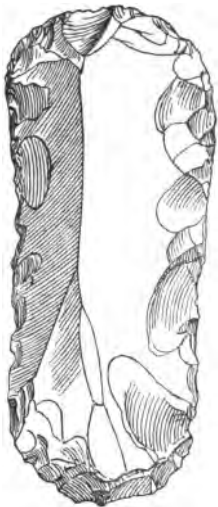


FIG. 35.—Double flint scraper, Cro-Magnon.



FIG. 36.—Point with shoulder, Les Eyzies.



FIG. 37.—Point with shoulder, Les Eyzies.

300 marine shells (specimens above), common on the Atlantic coasts ; also several perforated teeth, perhaps worn like the shells on a string round the neck. Worked antlers of the reindeer were discovered, but this animal was rare on the site in comparison with the horse ; and the fauna also comprised the mammoth, cave-lion, and cave-bear, wolf and pouched marmot. A good specimen of the double scraper, consisting of a flint-flake rounded at both ends by chipping on one face only, is here illustrated (fig. 35).

The cave of Les Eyzies, near Tayac, Dordogne, has been considered to mark the transition between the Solutr  and Madeleine periods, as the worked flints, which include the characteristic point with shoulder (figs. 36, 37), were far outnumbered by lance

or harpoon heads of the Madelaine type, made of reindeer-horn. The prehistoric site is situated in the face of the limestone cliff (see lithograph in Case 118), at an elevation of 120 feet above the present river-level; and is on the north side of the valley of the Beune, a stream that joins the Vézère about half a mile lower down the valley. Les Eyzies has produced examples of engraving (see Case 118 and fig. 65) of the kind more usual at Laugerie Basse and La Madelaine; and the quartzite pebbles with hollowed faces (fig. 38) are also more common in the succeeding period. Their use is uncertain; but, though it has been held that they served as mortars for grinding haematite or red ochre (specimens on *second shelf*), it is more probable that they were anvil-stones

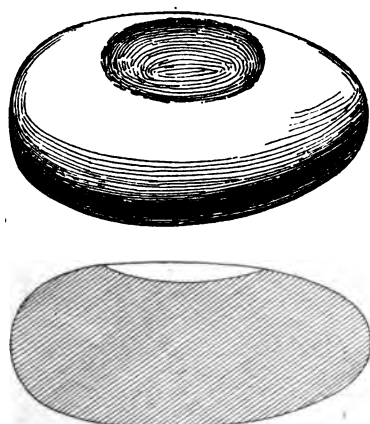


FIG. 38.—Quartzite pebble with hollow, Laugerie Basse.

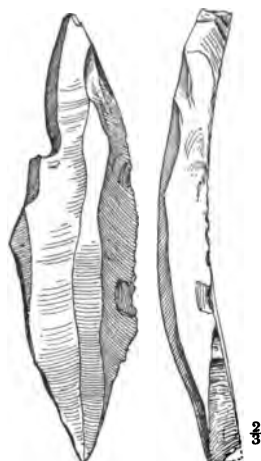


FIG. 39.—Double chisel, Les Eyzies.

for flint-working; and similar specimens of the neolithic age found in Ireland are shown in Case 132. Among the flint implements from this site may be noticed also those with transverse chisel edges sometimes at both ends (fig. 39); and a curious type of borer, the point of which is a narrow curve laboriously worked (fig. 40).

The cave of **Badegoule** (Badegols), near Beauregard, Dordogne, faces the south at an elevation of about 250 feet above the Cerne, a small tributary of the Vézère; and on a terrace in the rock, below the cave, was found breccia resting against the cliff, while the ground in front was strewn with worked flints, bones and teeth, including those of the horse, ox, and reindeer. Some of the implements were chipped in leaf-form, and the site can therefore be classed with Solutr .

Gorge D'Enfer is a ravine opening into the Vézère valley a little below **Laugerie**, and the caves have been explored on several occasions. The date of their occupation by primeval man is indicated by lance-heads of leaf shape (as figs. 32, 33) as well as by others of reindeer horn, with split base to receive the shaft (fig. 41); and the site may be classed as belonging to the transition period between **Solutré** and **La Madelaine**, for implements of bone and horn are rarely met with before the latter period.

The rock-shelter known as **Laugerie Basse** has been explored



FIG. 40.—Flint borer,
Les Eyzies.

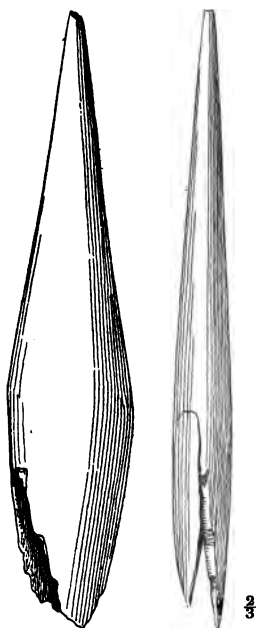


FIG. 41.—Horn lance-
head, Gorge d'Enfer.

by Messrs. Lartet and Christy and others, and is situated on the right bank of the Lozère, about 80 yards from the river, and about 25 feet above its level. Few sites have yielded more numerous examples of palaeolithic art; and the analogy to **La Madelaine** is rendered all the more striking by the absence of the **Solutré** type of flint implements that occur in the neighbouring site of **Laugerie Haute**. Carved and engraved representations of the human figure have been found at **Laugerie Basse**, among which may be mentioned the hunter of the aurochs; but more artistic work may be seen in the sketches of animals (fig. 66) exhibited

in Case 118. It was here also that the "crushed man" was discovered in the Madelaine stratum, and, though it has been suggested that this was a later burial, a huge boulder had evidently broken the vertebral column, and the ornaments found on the body were clearly of the palaeolithic period. Specimens of perforated teeth, etc., from this site, are exhibited in Case 119 (fig. 68).

A board at the back contains a number of diminutive implements (fig. 42) from Bruniquel: the back or thicker edge is fine chipped to form an irregular serration, but no suggestion has been made regarding their use.

Case 113.

On either side of the case are exhibited in glass-covered boxes remains from the rock-shelter called Montastruc, on the river



FIG. 42.—Finely-worked flint, Trou des Forges, Bruniquel.

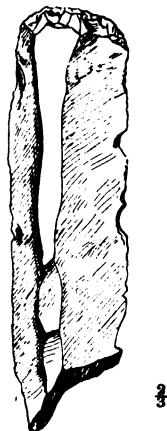


FIG. 43.—Flint scraper and graving-tool, Bruniquel.

Aveyron at Bruniquel (Tarn-et-Garonne). They form part of the large collection acquired from M. Peccadeau de l'Isle, the more important specimens being shown in the adjoining Cases 114, 115. The classifications of the palaeolithic epochs are here shown in tabular form, together with a list of the characteristic remains of each cave-period and a comparative table of typical sites in England, France, and Belgium. On the shelf are shown a few specimens of calcined flints from a *tertiary* stratum at Thénay (Loir-et-Cher); but further evidence must be produced before these can be generally accepted as proof that man existed in that very

remote period. To all appearance these flints could have served no useful purpose as implements, and their fracture by fire was more probably due to accidental causes than to the anthropoid ape.

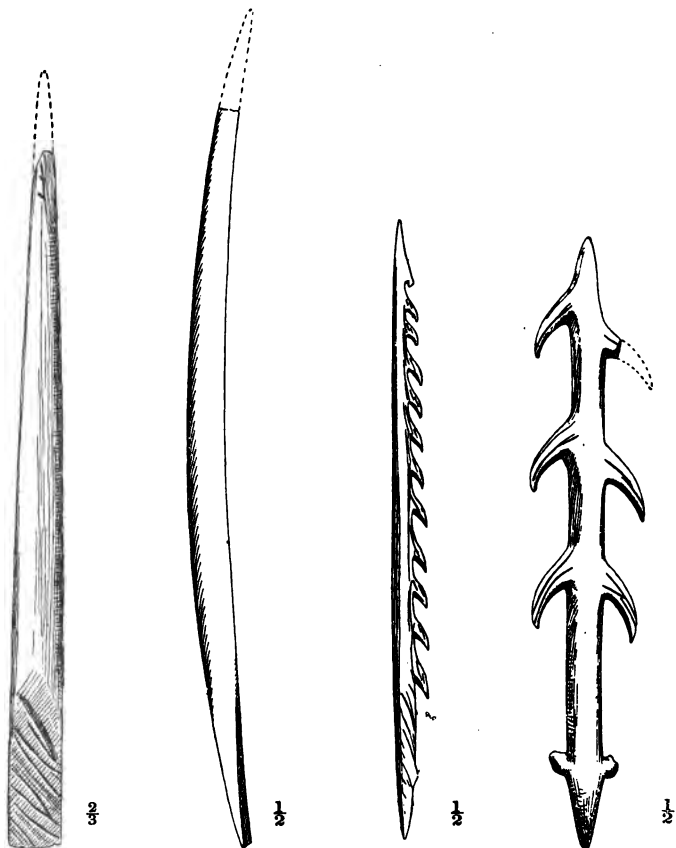


FIG. 44.—Javelin-head of horn, Bruniquel.

FIG. 45.—Javelin-head of horn, Bruniquel.

FIG. 46.—Barbed javelin-head, Bruniquel.

FIG. 47.—Barbed javelin-head, Bruniquel.

Cases 114, 115.

Antiquities from Bruniquel (Tarn-et-Garonne).

On boards at the back of these cases are mounted objects discovered in 1863-4 by the Vicomte de Lastic St. Jal in excavating the cave-dwelling known as **Trou des Forges** on the right bank of the river

Aveyron, a little above the village of Bruniquel (Tarn-et-Garonne).

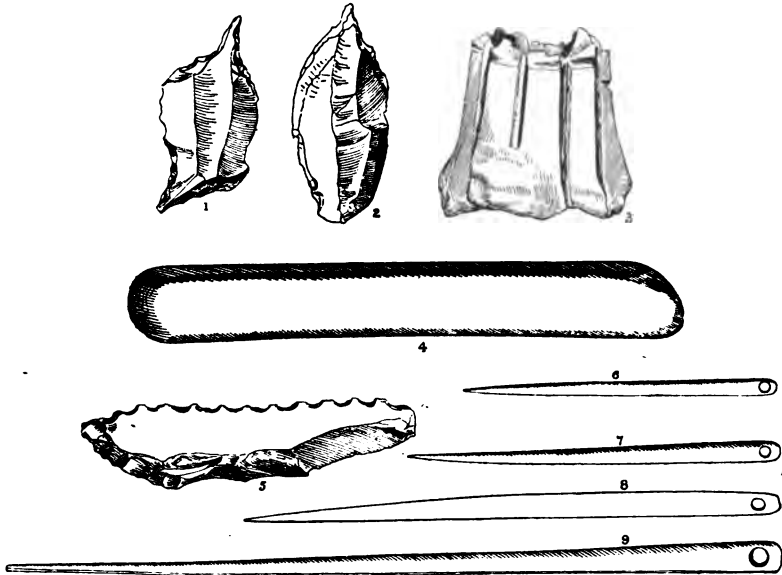


FIG. 48.—The manufacture of bone needles, Bruniquel.

Other remains from this site are exhibited on the top shelf of Cases 111, 112.

The entrance to this cavern is in the face of the cliff, about 40 feet above the bed of the river, the floor being composed of stalagmitic breccia, enclosing water-worn stones from the bed of the river, and also pieces of the reddish limestone of which the cliff is formed; the upper part of the breccia, 4-5 feet thick, was black with charcoal, and the lower part, 3-4 feet thick, was plain red earth; but every part of the breccia contained remains of the wolf, rhinoceros, horse, reindeer, stag, Irish elk and bison, together with implements of flint and bone.

The remains belong to the Madelaine period, and should be compared with the series in the adjoining Cases 116, 117. Among the flint or chert implements should be noticed a number of combined scrapers and graving-tools, rounded at one end as in the Solutré period, and pointed at the other at one side (fig. 43), perhaps for the purpose of engraving bone or horn.



FIG. 49.—Bone piercer, Bruniquel.

Javelin-heads of reindeer-horn are common in the Madelaine period, and many are here shown either with plain points, the butts cut like a wedge for fixing in the shaft (figs. 44 and 45), or barbed like a harpoon on one or both sides (figs. 46 and 47). Some specimens exhibit remarkably fine work, but the dexterity of palaeolithic man is perhaps best attested by the bone needles of the Madelaine period found at Bruniquel and elsewhere. Specimens from the Trou des Forges and Montastruc are shown on the *second shelf*, together with tools and material used in their manu-

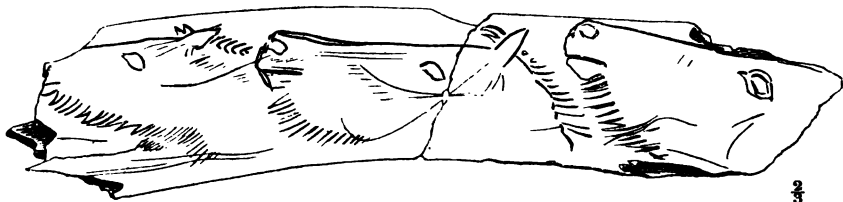


FIG. 50.—Engraved bone, Trou des Forges, Bruniquel.

facture. A splinter was first taken from the bone (fig. 48, No. 3) and then rounded by scraping with a serrated flint (No. 5). The tapering point and smooth surface were made by rubbing with a sandstone burnisher (No. 4), and the eye drilled with a pointed flint (Nos. 1 and 2). Needles of various sizes, probably for sewing skins, were thus produced (Nos. 6–9), and examples have been found showing that a second eye was sometimes drilled when the first was broken.

A bone piercer (fig. 49) may have been used to perforate the



FIG. 51.—Engraved bone, Trou des Forges, Bruniquel.

tougher skins, but the Eskimo are known to manipulate hides in such a manner as to render possible a direct use of their needles of bone or ivory.

Specimens illustrating the manufacture of bone needles are exhibited from two sites at Bruniquel on the *third shelf*, and are commonly found in cave-dwellings of the Madelaine period.

The engraved bones from this site are among the best known, and on the *second shelf* are exhibited part of a horse's rib with three horses' heads on both sides (fig. 50); part of the rib of a deer, engraved with heads of reindeer and wild goat (fig. 51); and on the same board a portion of the wing-bone of a bird with a

reindeer's head in outline; also the drawing of a fish. On a board at the back of the *third shelf* are some interesting carvings in the round of horses' heads, probably portions of javelin-throwers (fig. 52), such as have been found fairly complete at La Madelaine (No. 3), and are used at the present day by savage tribes on the N.W. coast of America (No. 1) and Australia (No. 2). The "throwing-stick" is used to increase the leverage of the arm, the butt-end of the missile resting against the peg or hook. These are all from the Trou des Forges; but more remarkable examples of palaeolithic art were discovered at the rock-shelter known as Montastruc, on the left bank of the river Aveyron, close to the village of Bruniquel.

The objects exhibited here in *glass-topped boxes* are from the collection of M. Peccadeau de l'Isle, who in 1866 excavated the area at the base of the cliff called Montastruc, which rises nearly 100 feet above the Aveyron. The rock-shelter itself is from 20–25 feet above the river and about 60 yards from the bank, but is still liable to floods. The three remarkable carvings (plate 1) shown on the *second shelf* were found almost together on this site; and a back view of each is provided by means of plaster casts. They are the handles of daggers such as that discovered entire at Laugerie Basse (see reproduction on the shelf below), but the blade in each instance has been broken off. The two carvings of reindeer are in mammoth ivory, and are of great artistic merit; while the mammoth, carved in reindeer-horn, does not appear to be so faithful a representation. The accompanying sketch (fig. 53) is inserted to show that the trunk reaches the fore-feet; the tusks, which were for the sake of convenience placed along the blade, are somewhat out of place.

On the *top shelf* is an interesting series of sandstone pebbles with sketches made by palaeolithic man of the animals around him. For purposes of exhibition, the outlines have been filled in with white, but one specimen is left in its original condition. Perhaps the most attractive is the figure of a reindeer (fig. 54), the legs being drawn on the opposite side of the stone. The contrast between two drawings of a bovine animal should be noticed (figs. 55 and 56), and the largest stone of the

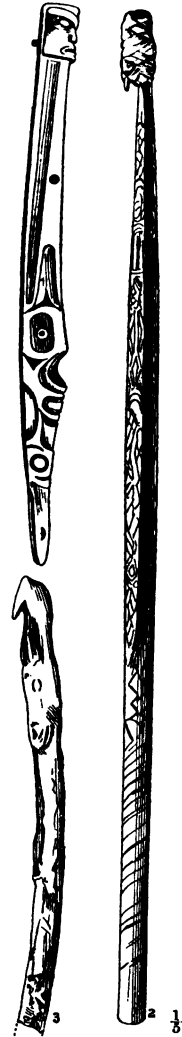


FIG. 52.—Examples of javelin-throwers.

series has sketches of various animals, including the goat (fig. 57).

On the *second shelf* in a glass-topped box are exhibited pieces of



FIG. 53.—Dagger with mammoth handle, Bruniquel.

reindeer horn showing human workmanship; and among them the well-drawn figure of a horse is worthy of special notice (fig. 58).

On the *third shelf*, attention may be drawn to a remarkable disc

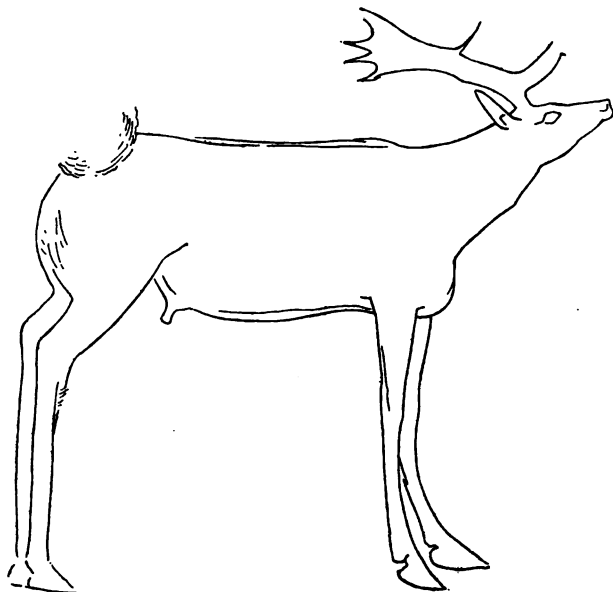


FIG. 54.—Engraved pebble, Montastruc, Bruniquel.

of horn with herring-bone engraving and serrated edge (fig. 59); it was probably a personal ornament, and may have been worn, like the perforated teeth, on a necklace, but the loop is now wanting.

Cases 116, 117.

Antiquities from La Madelaine, Dordogne.

The cave of La Madelaine (or, as it is sometimes written, Madeleine) has provided a name for the closing epoch of the

Palaeolithic Age, when the working of bone and horn was at its best, but the manufacture of flint tools and weapons had declined,

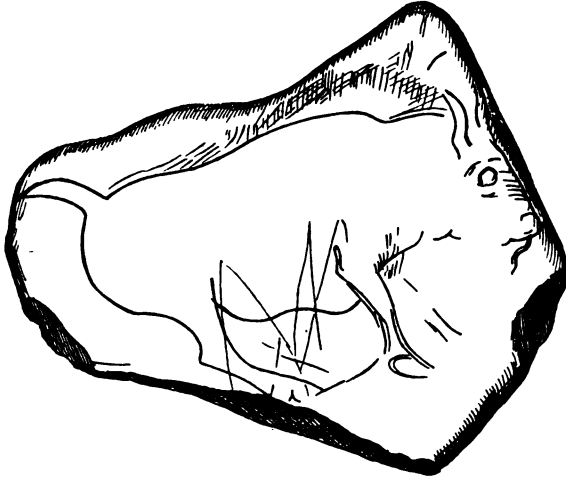


FIG. 55.—Engraved stone, Montastruc, Bruniquel.

being distinctly inferior to the products of the Solutré period. The settlements of the population were now sometimes in the open



FIG. 56.—Engraved stone, Montastruc, Bruniquel.

country, but the typical site is itself a rock-shelter on the right bank of the Vézère, at the foot of the cliff, and not far from the ancient castle of La Madelaine. It is about 30 yards from the

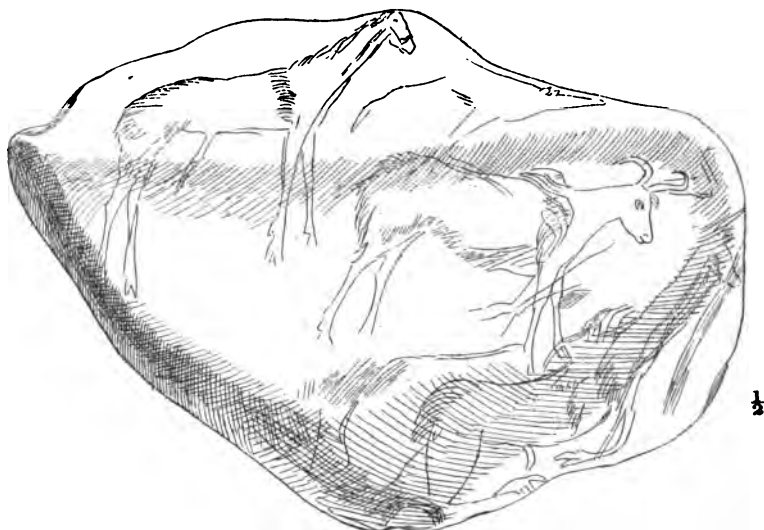


FIG. 57.—Engraved stone, Montastruc, Bruniquel.



FIG. 58.—Engraved bone, Montastruc, Bruniquel.

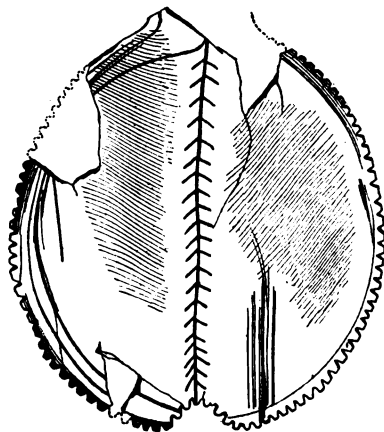


FIG. 59.—Engraved ornament, Montastruc, Bruniquel.



FIG. 60.—Flint ser La Madelaine.

river, and the upper surface of the deposit is not more than 20 feet above the level of the stream, being, like Montastruc at Bruniquel, within reach of floods. In the recess below the overhanging rock



FIG. 61.—Part of reindeer-horn sceptre, La Madelaine.

the beds attained a total depth of 8-10 feet, the upper part being principally rubble from the roof, and resting on layers of refuse resembling the kitchen-middens of a later period. The animal

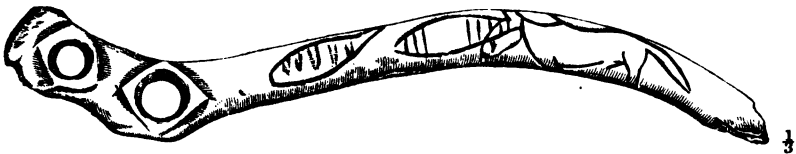


FIG. 62.—Reindeer-horn sceptre, La Madelaine.

remains corresponded to the fauna of Les Eyzies, and interspersed with them were hearth-stones, rubbing-stones and hollowed pebbles, together with flint flakes and cores and some remarkably

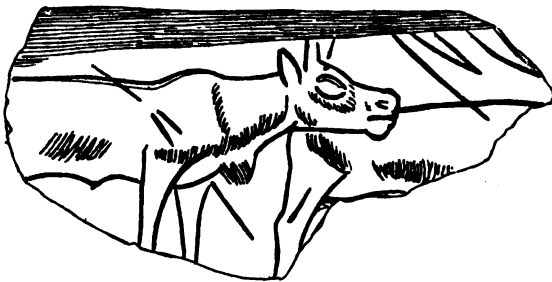


FIG. 63.—Bone engraving of reindeer, La Madelaine.

long flake-scrapers characteristic of this period (fig. 60) (see specimens on *top shelf*: the *bottom shelf* contains stones similar to those just mentioned, from Bruniquel).

The exploration of this site by Messrs. Lartet and Christy resulted in the discovery of a large number of horn implements, conspicuous among them being the somewhat mysterious *bâtons de*



FIG. 64.—Engraving of human fore-arm, La Madelaine.

commandement or sceptres, formed of an antler with one or more circular holes (fig. 61), and supposed to have been emblems of



FIG. 65.—Engraving on schist, Les Eyzies.

authority: many of them have engravings of animals, especially the horse (fig. 62). A number of small pieces of reindeer-horn on

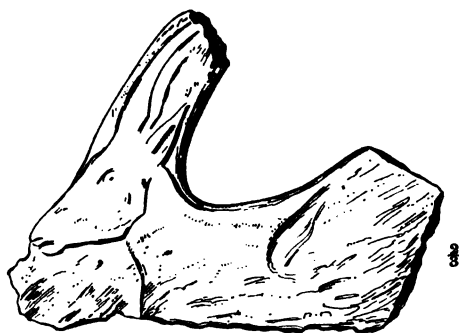


FIG. 66.—Head of ibex, Laugerie Basse.

the *second shelf* also have representations of animals such as the reindeer (fig. 63), and possibly of the human arm (fig. 64); also specimens with geometrical and other designs, the "bamboo" pattern being shown in fig. 61. At the end of this shelf are

lithographs of some of the more important engravings in this and other collections; and many of the objects from this site generously given by Mr. Christy to the French Museum of National Antiquities are represented by casts on the *third shelf*.

Cases 118, 119.

Remains from Foreign bone-caves.

On the *top shelf* are lithograph sketches showing by means of a

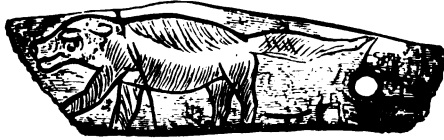


FIG. 67.—Engraving of glutton, Dordogne.

red cross the position of the cave-dwellings of Le Moustier and

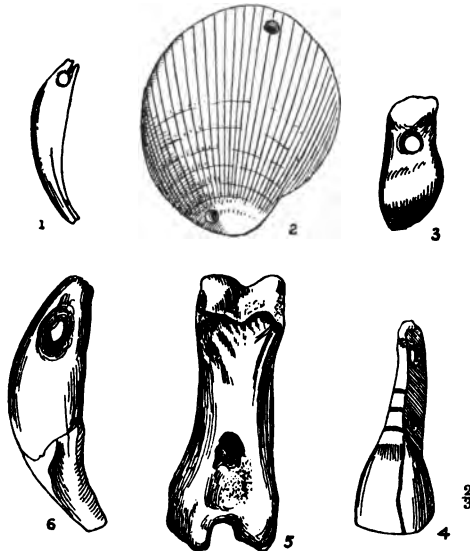


FIG. 68.—Perforated teeth, shell and bone, La Madelaine and Laugerie Basse.

Les Eyzies; also the cliff at Tayac and the castle of Les Eyzies, all in the Dordogne, France. Also reproductions of engravings on

reindeer-horn chiefly from La Madelaine and nearly all in the collection.

On the *second shelf*, to the left, are engravings on schistose stone from Les Eyzies (fig. 65); a graceful head of an ibex on reindeer-horn from Laugerie Basse (fig. 66); and the unmistakable figure of a glutton (fig. 67) from one of the Dordogne caves, a further indication that the climate during the Madelaine period was of a sub-arctic character. At the back are reproductions of engravings in other collections, including the well-known figure of a mammoth on a piece of ivory, presented to the Natural History Museum at Paris by Mr. Christy. In the restoration of the mammoth, the tusks should curve inwards at the point.

On the *second and third shelves* are specimens from cave-dwellings, all probably of the Madelaine period, in Belgium (Trou Magrite and Trou de Chaleux, near Namur); in Germany (Hohlefels and Schussenried, Württemberg, the mosses found at the latter site—*Hypnum sarmentosum* and *H. aduncum* var. *groenlandicum*—indicating a very low temperature); and in the extreme south of France (Massat, Ariège; and Lourdes, Hautes Pyrénées). In boxes to the right are perforated objects from La Madelaine (fig. 68, Nos. 1-3), including a canine tooth of the fox and deer and a shell, *Pectunculus glycymeris*, all probably worn as pendants; and others from Laugerie Basse (fig. 68, Nos. 4-6), a canine tooth of the wolf and an incisor of the aurochs (?), as well as a phalangeal bone of the reindeer, perhaps used as a whistle. A few stone implements, bone harpoon-heads, etc., from countries still or till recently inhabited by primitive tribes, are placed here for comparison with the products of the palaeolithic cave-men.

Case 120.

(Note.—In chronological order this case should come between Cases 124 and 125.)

A small series from the **Kjökkenmöddings** (kitchen middens) of the Danish Coast, which are great heaps of shells, principally those of the oyster, accumulated on the sites of early settlements. Like the modern inhabitants of Tierra del Fuego, the people who occupied these sites lived chiefly upon shell fish, and the refuse of their meals in course of time formed large mounds, sometimes hundreds of yards in length, in which numerous flint implements, bones and fragments of pottery are found embedded. The implements are of a rude description, and unground (fig. 69); but the size of some of the flakes argues a considerable skill on the part of those who produced them. From their rough and unfinished appearance these implements

have usually been assigned to an early period of the Neolithic Age, when the polishing of stone, if known at all, was rarely practised, but some prominent archæologists have referred them to a later period; and in support of this view it may be mentioned that some of these rudely-chipped specimens appear to have been made from finely-polished tools. This would suggest that they may be the work of a very poor and backward community living in contact with a higher civilisation. The bones of mammals found in the shell-heaps are chiefly those of the stag, roe-deer, and wild boar, the sheep, horse, and reindeer being unknown; the long bones have been broken to extract the marrow, so that it is evident that the people of the kitchen middens lived in part at least on the products of the chase. They appear to have had no knowledge of agriculture, and their only domestic animal was the dog. Shell-heaps of a somewhat similar description occur in the British Isles, *e.g.*, on the Moray Firth, Loch Spynie, and at Oban in Scotland; on the Wash, at Hastings, Ventnor, Tenby, and in Devonshire and Cornwall in England; and on the shores of Cork Harbour, Ireland; but these remains are not all of the same early date.

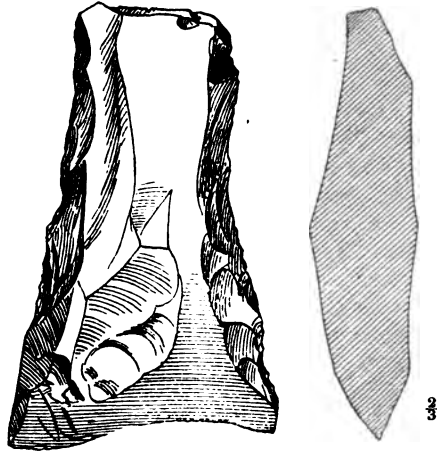


FIG. 69.—Flint implement, kitchen-midden, Denmark.

In the upper part of the case are specimens of flint flakes and implements from Eriksholm and the great shell-mounds at Meilgaard in North-East Jutland, with a few implements or hafts of deer-horn; in the lower part is a section from the Meilgaard Mound. Among the shells can be seen a few bones and flint implements.

ENGLISH BONE-CAVES.**Cases 121-124.**

THE scientific value of bone-caves was recognised at an early date in England. As long ago as 1816 the systematic exploration of a cave in the Devonian limestone at Oreston, near Plymouth, was undertaken by Mr. Whidbey, and the former existence of the rhinoceros in that region was fully established. This discovery followed close on the exploration of the Gailenreuth cave in Franconia, and preceded by about four years the publication of Dean Buckland's researches at Kirkdale, near Helmsley, in the North Riding of Yorkshire. The *Philosophical Transactions* of the Royal Society for 1822 contain an account of the cave as well as the Dean's famous deductions from the evidence obtained, which pointed, as he thought, to the action of a universal deluge. The *Reliquiae Diluvianae*, published in 1824, owes its title to this preconception, and from the high scientific standing of its author, had an important influence on the study of early man. Besides several bone-caves in Germany and other parts of Europe, animal remains from many of which are exhibited in the natural history branch of the British Museum at South Kensington, the Dean described in more or less detail the discovery of bones of extinct animals at Kirby Moorside (near Kirkdale), at Hutton in the Mendip Hills, Somerset; at Balleye and Dream Cave, Wirksworth, Derbyshire; three sites at Plymouth; and Crawley Rocks and Paviland (Goat's Hole), near Swansea. Some interesting drawings and diagrams are included in Dr. Buckland's work, and the discovery of the entire skeleton of a rhinoceros in the Dream lead mine may be mentioned as being of special interest.

The impetus thus given to the exploration of bone-caves resulted in the patient and successful investigation of Kent's Cavern, Torquay, by the Rev. J. McEnery between 1825 and 1841; and the occurrence of flint implements in intimate association with fossil bones proved that man was contemporary with animals now extinct or not represented in this country. His researches were subsequently verified on the same site by

Mr. Godwin Austen in 1840, and six years later by the Torquay Natural History Society; but the final examination of the cave extended over twelve years, and some of the results are shown in Cases 121, 122 (see p. 61).

Of the palaeolithic bone-caves not represented in this collection may be mentioned those of Banwell, Burrington, Sandford Hill, Bleadon and Hutton, all in the Mendip Hills; and the important series excavated by Professor Boyd-Dawkins and published in his *Cave-Hunting*. Much valuable information as to the conditions of human life in palaeolithic times has been derived from Wookey Hole, near Wells, Somerset, and various caves in the district of Gower, South Wales; while the Victoria Cave at Settle, W. R. Yorks, is specially interesting as having been a human dwelling-place at intervals down to Romano-British times, though there is little evidence that man was there contemporary with the hyaena of the lowest levels.

The late Dr. Falconer published accounts of discoveries in the neighbourhood of the famous Paviland Cave; and met with remains of the *Rhinoceros hemitoechus* as well as the woolly rhinoceros, the mammoth and the earlier *Elephas antiquus*; while the limestone on the opposite side of Caermarthen Bay contains several bone-caves, such as Coygan Cave, near Pendine, and the tunnel-cave called the Hoyle. King Arthur's Cave, near Whitchurch, Monmouthshire, overlooks the valley of the Wye, and is about 300 feet above the river; it was found to contain the gnawed remains of the cave-lion, Irish elk, mammoth, woolly rhinoceros, and reindeer, while flint-flakes, proving that it was also the resort of man, occurred in undisturbed strata. The sand and gravel may have been introduced at a very remote date by the river before the valley was cut to its present depth; and a similar explanation has been suggested for the presence of silt and water-worn pebbles in a fissure once inhabited at Cefn, near St. Asaph, North Wales, and also in Kent's Cavern, Torquay. Other bone-caves in the Vale of Clwyd are at Pont Newydd and Plas Heaton, and exploration has shown these to have been favourite resorts of the cave-hyaena, the teeth of which have left unmistakable traces on the bones of large carnivorous and other animals.

The more important of the palaeolithic cave-dwellings are marked with black pins on the map of England and Wales at the foot of the western spiral staircase, and it is clear that some of the sites were included in the area covered by glaciers during the great Ice Age. It is obvious, therefore, that man was in occupation either before or after that period, and the

oldest deposits sometimes contain quartzite and flint implements of very rude workmanship, suggesting an antiquity even greater than that of the human handiwork discovered in the drift-gravels.

Cases 121, 122.

Second shelf: To the left, on the back of the case, are remains from a cave on the slope of Windmill Hill, near Brixham, Devon.

This early site of prehistoric man is generally known as the **Brixham Cave**, and was excavated under the superintendence of a committee of the Geological Society, the necessary funds being supplied by the Royal Society. The cavern was formed by the action of water as it eroded the valley; and to the draining of the higher gravel is due the deposit of **gravel** at the base of the excavation, where water-worn stones but no fossils occur. During occasional droughts the cave seems to have been frequented by animals, their remains, however, being very scarce in that bed, while indications of man are comparatively numerous. As the valley became deeper, the cave became drier, and was more resorted to by beasts of prey; but during a long period intermittent floods must have deposited the silt forming the **cave-earth**. This layer contained about 95 per cent. of the bones found in the cave, and an occasional flint implement shows that man was living in the neighbourhood. In the upper part of the cave-earth bones of the bear were very numerous, and the remains of cubs show that for some time this retreat was given over to this cave-haunting carnivore. Finally, as the floods ceased to reach the level of the cave, drippings from the roof deposited the layers of **stalagmite** which sealed up and preserved in an undisturbed condition the shingle and cave-earth of preceding eras. The cave, however, still continued to be the occasional resort of beasts of prey; and remains of the reindeer, together with those of the bear and rhinoceros, were found in the stalagmite floor. From that time detached blocks from the roof and the accumulation of *débris* rendered the cavern inaccessible to man.

The rest of this case contains a representative series of objects found at different levels in **Kent's Cavern**, or Kent's Hole, a cave in a limestone hill flanking a valley which about half a mile to the south terminates on the south coast of Devon, about a mile east of Torquay Harbour. It has been examined and excavated in part on more than one occasion since 1824, but a

thorough exploration was carried out between 1868 and 1880 by a committee of the British Association. The excavations were mainly directed by the late Mr. Pengelly, of Torquay, who also acted as reporter; and it is mainly to his careful and systematic work that we owe our knowledge of the early conditions of life in this the most important cave-dwelling in the country.

Though all the strata were not uniformly represented, the following is the descending order in which they occurred:—

1. **Blocks of limestone** fallen from the roof, weighing from a few pounds to upwards of one hundred tons each, and in some parts cemented together by carbonate of lime.

2. A dark mud, known as the **Black mould**, from three to twelve inches thick, consisting largely of decayed leaves and other vegetable matter.

3. **Stalagmite floor**, commonly of **granular** texture, from one inch to upwards of five feet in thickness, frequently interspersed with limestone blocks.

4. Confined to an area of about one hundred square feet was the **Black band**, about four inches thick, mainly composed of small pieces of charred wood.

5. Light red clay, known as the **Cave-earth**, containing on the average about 50 per cent. of limestone fragments, and various remains covered with thin stalagmite films. In some parts of the cave, this layer was not present, and elsewhere it was never more than four feet thick.

6. Wherever the bottom of the cave-earth was reached, there was found a **stalagmite floor** of **crystalline** texture, and sometimes as much as ten or twelve feet thick. Isolated crystalline masses also occurred in the cave-earth.

7. The lowest and oldest deposit in the cavern was composed of rounded pieces of quartz and dark red grit embedded in a sandy paste of the same colour. This is called the **Breccia**.

Second shelf: Implements of the Stone Age, ranging from the earliest handiwork found in this cavern on the left to the polished stone implement of neolithic times on the right. Man was evidently living on or near this site during the formation of the dark-red breccia; and his implements, which occurred here and there in that stratum, were of rude and massive forms with unsymmetrical outlines. They differed from those of later date in being manufactured not from flakes, but from the flint nodule itself (fig. 70). Several specimens are exhibited in the original matrix, and their depth from the datum line or the top of a particular stratum noted on the labels.

The flint and chert implements found in the cave-earth were carefully formed from flakes struck off for the purpose from blocks of stone, and show a more advanced stage of manufacture. They are ovoid, lanceolate and tongue-shaped, and resemble specimens from the river-drift as well as from the typical French caves of

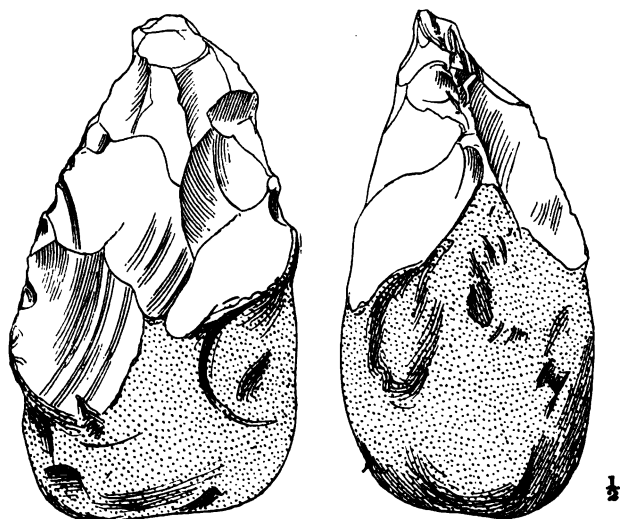


FIG. 70.—Flint implement, Kent's Cavern.

Le Moustier (fig. 72), Solutré, and La Madelaine. Besides stone implements, the cave-earth also yielded a bone needle, a perforated bone of the hare (perhaps a whistle) (fig. 71), three bone or horn javelin-heads (of which one is shown) with barbs like a harpoon

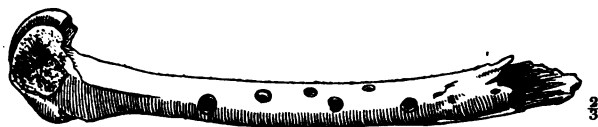


FIG. 71.—Perforated bone of hare, Kent's Cavern.

(fig. 73), hammer-stones (fig. 74), objects resembling whet-stones and a badger's tooth bored for use as a personal ornament. Reference to Cases 111-119 will show certain analogies to palaeolithic finds in France.

Third shelf: The black mould or uppermost deposit is separated from the preceding by a crust of stalagmite that must have been formed during an immense period. The earliest remains are of

the Bronze period, such as the socketed celt and gouge here exhibited. These are succeeded by fragments of ornamented pottery dating from early British and Romano-British times, the



FIG. 72.—Flint chopping-tool, Kent's Cavern.

contact with Rome being shown by a scrap of the red ware known as Samian. A knowledge of metal working is also proved by the discovery of a cake of smelted copper; while the spindle-whorls and bone combs, probably used by the ancient Britons in weaving, indicate an advance in domestic arts. More recent still are pieces of glazed earthenware that evidently date from mediaeval times. Animal remains from this stratum comprised bones of man, the dog, fox, badger, brown bear, Celtic short-horned ox, roe-deer, goat, pig, hare, rabbit, water-vole, seal and sheep, the last being the most plentiful. These all belong to species that still exist, and in some instances still occupy the same district.

Fourth shelf: Animal remains from the prehistoric levels of the cavern, showing that it was occupied from time to time by wild beasts that are now either extinct or mainly confined to extreme climates. In the granular stalagmite, black band and cave-earth extinct as well as existing species were found.

The cave-hyaena was most prevalent, but the horse and rhinoceros were nearly as common. Remains of the Irish elk, wild bull, bison, red deer, cave-bear, brown and grizzly bears were not rare.



FIG. 73.—Barbed javelin-head, Kent's Cavern.

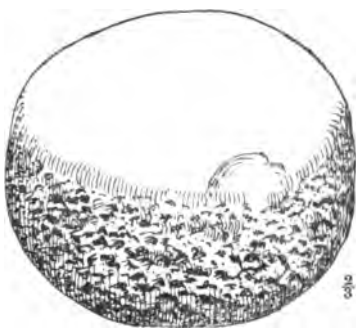


FIG. 74.—Hammer-stone, Kent's Cavern.

Those of the cave-lion, wolf, fox and reindeer were less numerous; and those of the beaver, glutton and sabre-toothed tiger were very scarce. The bones had been rendered light and porous by the loss of the organic matter, and many of them had been gnawed and cracked by hyaenas.

In the lowest deposits (the crystalline stalagmite and the breccia), animal remains were less uniformly distributed, but in some spots formed about half of the deposit. These belonged exclusively to the bears, and there was nothing to indicate the presence of the hyaena. The bones from these layers were mineralised and brittle, sometimes emitting a metallic sound when struck.

Cases 123, 124.

Top, second and bottom shelves: Remains from the limestone caves of **Creswell Crag**, on the north-eastern border of Derbyshire, sections of the three principal sites being given with explanatory notes. Both sides of the ravine are much fissured, and the caves open some 15 feet above the lake formed by the damming of the stream.

The following comparative table shows the succession of strata where all occur, in descending order:—

| <i>Church Hole.</i> | <i>Robin Hood's Cave.</i> |
|--|--|
| 1. Stalagmitic breccia, with charcoal, worked flints, and bones. | 1. Surface soil. |
| 2. Reddish cave-earth, with charcoal fragments, layers of charcoal, flint implements, bones, and blocks of limestone. | 2. Breccia with a few bones and flint implements. |
| 3. Lighter cave-earth, with similar remains. | 3. Cave earth with bones and implements. |
| 4. Mottled cave-earth, more sandy, with small angular fragments of friable limestone; quartzite and flint implements, and bones. | 4. Mottled bed, light brownish matrix; bones and implements. |
| 5. Light-reddish sandy earth; bone, but no implements. | 5. Red sand, with bones and implements of quartzite. |
| 6. White calcareous sand and rock. | |

Both these caves were occupied, during the deposit of the lower cave-earth and red sand, by men who made and used rude implements of quartzite such as are seen on the top shelf.

These seem to prove that the hunters of that period belonged to the same race as the dwellers in the open country who have left their implements of quartzite and flint (see Case 105) in the drift-gravels of our rivers. In the breccia and upper cave-earth of both caves are found implements of a higher order, made of flint brought from a distance and in workmanship like those of the Solutré type. The similarity to palaeolithic caves in France is also proved by the bone engraved with the head of a horse (fig. 75), as well as by implements of bone and antler, such as occur in Continental caves of the Madelaine period.



FIG. 75.—Horse's head engraved on bone, Creswell Crags.

The conditions in Mother Grundy's Parlour were somewhat different. Here the strata, in descending order, were :—

1. Surface soil.
2. Red sandy cave-earth with bones and other remains.
3. Red clay, with bones.
4. Ferruginous yellow and red sand, with bones.
5. White calcareous sand, with no remains.

In layer 2 were found quartzite implements such as occur in the red sand below the cave-earth elsewhere ; but the red clay and ferruginous sand contained a peculiar fauna. The hippopotamus and leptorhine rhinoceros occurred with the hyaena and bison, but the horse, woolly rhinoceros, and mammoth were absent, and there were no traces of contemporary man. The hyaena was the principal occupant of Robin Hood's Cave during the deposition of the lower red sand and clay, but this occupation was interrupted by floods ; and while the cave-earth was accumulating, man also made his appearance here and lived chiefly on the hare.

It may be added that the association of the hippopotamus and leptorhine rhinoceros, both animals of southern habit, points to an early pleistocene date, especially as these animals are often found in company with the *Elephas antiquus*. The hippopotamus is a survival from the pliocene fauna, and though common in the drift gravels, is, like the leptorhine rhinoceros, less frequently found in caves ; although rarely associated with the mammoth, both have been found with arctic mammals such as the reindeer.

Top shelf: Specimens of chipped quartzite evidently fashioned by man from pebbles (fig. 76); and better worked flint flakes, which show an advance in manufacture. Among the latter may be distinguished forms that correspond closely to specimens of the Solutré period in Cases 111, 112: the flat leaf or lozenge-shaped lance-head (fig. 77, No. 1), the flake-scrapers with one or both ends rounded (Nos. 2 and 3), and a small oval implement with serrated edge (No. 4).

Second shelf: Diagrams showing sections and ground-plans of the three principal caves, with some details of the human and other remains discovered. Specimens of the breccia, containing implements and bones of extinct animals. Two iron-stone implements (fig. 78) of oval shape should be noticed, as also bones of the woolly rhinoceros gnawed by the cave-hyaena (fig. 79).

At the back are five photographic views of the Creswell Crags; and on boards are specimens of flint, horn and bone, including a fine leaf-shaped implement, a needle, gouge and borer of bone, and the only



FIG. 76.—Quartzite implement, Creswell Crags.

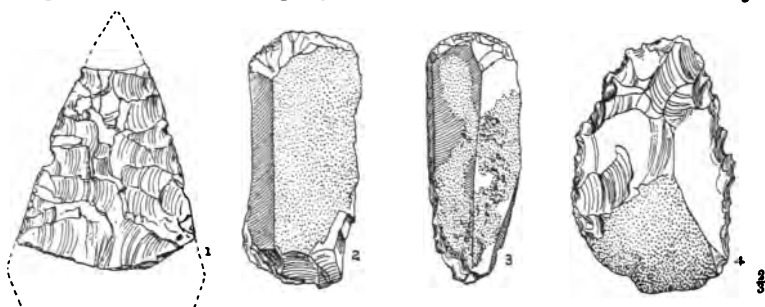


FIG. 77.—Flint implements, Creswell Crags.

engraved bone of the palaeolithic period found in England, with an outline sketch of a horse's head (fig. 75). These remains may be contemporary with the Madelaine finds in France.

Bottom shelf: Animal remains similar to those from Kent's Cavern in the preceding case: but special attention may be drawn to the tip of an hippopotamus-horn and of a mammoth-tusk, those animals being characteristic of different latitudes, as are also the woolly rhinoceros and cave-lion, the hyaena and reindeer, etc. An extensive collection of fossil bones from this and other palaeolithic caves is on exhibition at the Natural History Museum.

Third shelf: A small series of remains discovered in caves and tunnels of the limestone at Torbryan, near Denbury, Devon. Most of the excavation was due to the unaided efforts of Mr. Widger, but the published accounts are inadequate, and the diagram in this case must be regarded merely as indicating the succession of the beds with their principal contents, the more precise measurements of their depths being in some cases contradictory. The upper beds appear to have been generally as follows, in descending order:—

1. Angular stones.
2. Black mould.
3. Stalagmite floor.
4. Diluvium, or angular and rolled stones.
5. Stalagmite floor.
6. Cave-earth (red clay) = reindeer stratum.

Under these, in one part, were clays and sand, with remains of an older crystalline floor such as was also observed in a broken



FIG. 78.—Ironstone implement, Creswell Crags.



FIG. 79.—Rhinoceros bone gnawed by hyaena, Creswell Crags.

condition at Kent's Cavern; elsewhere, the lower beds were a dark, fetid earth with quartz pebbles and with remains of hyaena; a bone-bed with the usual cave-fauna found in this country; and a

deposit containing remains of the cave-bear. Some of the animal bones are preserved at South Kensington, and the objects of human handiwork here exhibited are of a miscellaneous description, with insufficient details of their discovery; but the difference in colour of the flint flakes is due to the fact that some are stained by the charcoal bed at the surface of a pit near the entrance, the rest occurring at a deeper level in the same pit. Along with the blackened series was found the interesting little object of bone (fig. 80), which is pierced as though intended to hang by a string to the person.

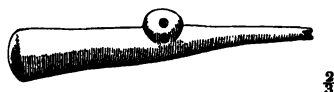


FIG. 80.—Pierced object of bone, Torbryan Cave.

The sandstone spindle-whorl may belong to the Neolithic or a later period, but there can be no doubt as to the polished stone axe-head here exhibited. The piece of basalt may also have served as an implement, and should be compared with an axe-head of the same material on the top-shelf of Case 127, found near Bridlington, on the coast of Yorkshire.

[A fine series of remains from the cave-earth of Kent's Cavern is exhibited in the Department of Geology and Palaeontology, **Natural History Museum**, comprising stone implements of various forms manufactured from the nodule, as well as worked flint flakes, some of which show considerable skill. There are also specimens of human handiwork from certain of the Welsh caves dating from palaeolithic times, as well as a small series (including neolithic implements) from Torbryan Cave. Attention may further be directed to an entire antler of a reindeer superficially imbedded in the stalagmite floor of Brixham Cave (see p. 60); a block of breccia from Trou des Forges, Bruniquel, enclosing a human skull; and the fossil remains of extinct animals from the pleistocene beds and various caves, both in England and abroad. Casts of the skull of the sabre-toothed tiger are exhibited; and the extraordinary size of the extinct fauna is illustrated by the skull of a cave-lion placed beside one of the modern species, and the complete skeleton of a cave-bear. In the centre of the gallery are skeletons of the mammoth and Irish elk.]

THE NEOLITHIC AGE.

At the beginning of the Neolithic Age, great changes had come over the face of Europe. The dry cold of the later Cave Period had given place to a more temperate and rather moist climate; while of the animals with which the cave-dwellers had been associated, some, like the mammoth, had become extinct; others, like the reindeer, had wandered to distant regions. Great Britain, formerly a part of the Continent, had again become an island, and Africa and Europe had been divided by the Mediterranean Sea. Changes almost as remarkable had modified the old manner of human life. Man had now learned to tame animals and train them to his domestic use; he cultivated cereals for food, and textile plants to provide material for woven garments; he used the bow as his ordinary weapon; he had developed the art of making pottery; and he often constructed dwellings raised on piles in lakes and rivers to secure himself against danger of attack. The burial of the dead now became a matter of ceremonial importance; and from the chambered sepulchral mounds (long barrows) erected over the bodies of chiefs, as well as from other megalithic monuments, we may perhaps derive evidence of the birth and increase of primitive religious beliefs.

In the provision made by man for his defence and for the needs of everyday life, there had also been a great development. Implements and weapons were now commonly hafted and made in a greater variety of forms; while by the adoption of grinding and polishing, it became possible to employ other hard stones in addition to flint or quartzite. The use of polished stone has been sometimes regarded as the special characteristic of the newer Stone Age; but a large and important class of the more delicate implements and weapons, such as knives, scrapers and arrow-heads, were but rarely ground or polished, while even axes of exceptionally fine workmanship were sometimes finished by chipping alone. And down to the very end of the period, thousands of implements must have been manufactured, the grinding of which would have been simple waste of time. We

cannot always with certainty assign particular uses to individual prehistoric implements; but we may assume that some of the rough axe-like tools were employed, as presumably in prehistoric Egypt and in North America, for breaking clods or other simple agricultural operations. Tools of this kind would be rudely chipped into shape and perhaps ground a little at the edge, the rest being still left in the rough. It is unlikely that all the roughly-chipped axes of the Neolithic Period found in Great Britain and elsewhere should be imperfect, implements still awaiting the final process of grinding and polishing. This may be in part the case with the unground implements of Grime's graves and Cissbury (Cases 125, 126), which probably represent the uncompleted products of the factories existing on those sites. But numbers of the unground neoliths which are picked up in our fields are doubtless completed tools; and some of the rudest flint implements ever found in Britain are those discovered in 1901 in the foundations of Stonehenge, where they had evidently been used for dressing the surfaces of the monoliths: yet Stonehenge is commonly assigned to the Bronze Age. Mere roughness of form unsupported by any other evidence is therefore no guarantee of the antiquity of an implement. A few words must be said in this place as to the hafting of axes in neolithic times. The collection contains specimens with the original hafts complete from Ehenside Tarn, Cumberland (Case 131), Solway Moss (Table-Case B), and the Lake Dwellings of Switzerland (Case S). The method adopted in all these examples was not that commonly preferred by savage tribes, viz., the lashing of the blade to the short limb of a pick-shaped handle in the manner illustrated by several examples shown in a frame on the wall adjoining Case 152. The procedure was to cut a transverse hole fitting the butt of the stone blade in a straight haft, the upper end of which was left thick enough for the purpose. The objection to this method is that the force of repeated blows is liable to split the wood, though, as will be seen from the Swiss examples, the lake-dwellers had invented a device which obviated this disadvantage. They fixed the blade in a socket of deer-horn (fig. 81), the elasticity of which deadened the effect of the blows upon the wood.

Although for the sake of convenience we use the terms Stone Age, Bronze Age and Iron Age, there is of course no sharp line of demarcation between the actual periods which they describe. Stone implements continued to be largely used after the introduction of metal, and are constantly found in the Round Barrows in conjunction with bronze; while the Bronze and Iron Ages

overlap in the same way. Indeed, for certain exceptional purposes, stone and flint have not been superseded even in our own day; gun-flints, grindstones and burnishers are cases in point. Their survival is not always due to utilitarian reasons, but sometimes to motives of superstition or religion, the methods and appliances of ancient days having acquired in course of time a sanctity which keeps them in ceremonial use long after they have been discarded for ordinary purposes. Thus the Egyptians continued to use stone knives for embalming the dead centuries after the introduction of metals into the valley of the Nile; and the priests of ancient Mexico tore out the hearts of their victims with blades of stone or obsidian, though for secular purposes bronze had long been in common use. In



FIG. 81.—Stone axe-head mounted in horn and wood, Swiss Lakes.

the same way men who were well acquainted with bronze and iron deposited flint flakes and stone implements in the graves of their dead in perpetuation of an ancient tradition. The custom was known among the Merovingian Franks, and survived in folklore, though with an altered significance, to a much later period. Shakespeare alludes to it as an unchristian usage fit only for the interment of a suicide:

“For charitable prayers,
Shards, flints, and pebbles should be thrown on her.”
(*Hamlet*, Act v., sc. 1.)

As amulets to avert the evil eye and protect the wearer from disease, neolithic implements, especially small axes and arrow-heads, have been in request from ancient times down to our

day in almost every country, civilised or savage, in which stone has been long superseded by metal. Stone axes and flint arrow-heads are often thought to be thunderbolts which had fallen from heaven, and are known under various names, of which that of "elf-shot" is the most familiar. Only a very few years ago application was made to the director of the Liverpool Public Museums for permission to apply a stone axe-head to the body of a sick child, while the existence of a similar superstition in other countries is exemplified by the specimens exhibited in Table-Case L, which are amulets worn in different parts of Europe at various times. If further illustration is needed, it may be found in the Gold Ornament Room, where there is shown an Etruscan gold necklace having a mounted flint arrow-head as a central pendant. In Cases 150, 151 are two small polished axes from Egypt evidently used in the same way, while the ground haematite axe-heads from the Nile-Congo watershed in Case 148 are held by the present natives of the country to be effectual remedies against disease. The frequent representation of stone axes in conjunction with other ceremonial objects on the curious bronzes from Benin exhibited in the African section of the Ethnographical gallery affords an additional proof of the same widespread superstition.

Although there are but few objects in the collection which can be referred to barrows (burial mounds, tumuli) of the neolithic period, a few words must be added here on the subject of these monuments. The custom of raising a mound over the dead, so commonly adopted in the old and new worlds, was practised in Western Europe from neolithic times through the age of bronze into the period when iron was extensively used.

In Britain the barrows which appear to belong to the neolithic period, before any metal, excepting perhaps gold, was in use, are known from their shape as LONG BARROWS, to distinguish them from the Round Barrows, which from their not infrequently containing articles of bronze, are assigned to the period after the introduction of that metal. Long Barrows generally point east and west, the eastern end being rather broader and higher than the other. The body has usually been placed in a rudely made chamber of stone, sometimes with an opening in the walls at one end. These barrows are more plentiful in the south-western counties of England than in the north, and the burials evidence both inhumation and cremation, the latter rite being generally performed in the chamber where the body lay. When the body is buried unburnt, the bones are often disjointed, as if the skeleton had been placed in the mound after

the flesh had decayed. In connection with this peculiarity it may be noted that in Tahiti the interment of the bones of the dead only took place after the complete decay of the flesh, and that in other parts of the savage world a long interval is allowed to elapse between death and burial. Something of the same kind may have occurred in Spain during the Bronze Age, as in that country two skeletons have been found in a single urn which would not have contained the bodies of two persons buried shortly after death. It is rare to find any articles associated with the body in a neolithic barrow, and for this reason there is but little in the collection to represent this type of interment. The physical character of the long barrow skeletons differ from those of the round barrows of the Bronze Age; the former are invariably long-headed, while the latter are generally round-headed, though long skulls sometimes occur. By way of explanation it may be added that skulls are classified by measurement, the length being represented by 100, and the breadth regarded as a percentage of the length. Most skulls vary in breadth between 70 and 85, and within these limits three classes have been established. Those between 70 and 75 are called *dolichocephalic* (long-headed); those between 75 and 80 *mesaticephalic* (medium-headed); and those between 80 and 85 *brachycephalic* (short-headed).

It must be remembered that when we speak of the Neolithic Age, we do not imply a civilisation uniform in all parts of the world. There are differences in the style of neolithic objects even within the limits of Europe, nor can we assume that customs and beliefs were everywhere the same. The men who brought the new arts into Europe probably belonged to various tribes and issued from centres in which the habits of life were dissimilar. As a single instance of such divergence, it may be mentioned that although the megalithic monuments are characteristic of the later Stone Age, there is no evidence that the inhabitants of the Swiss pile-dwellings ever erected them on the shores of their lakes. Yet their culture must have been in other respects very similar to that of the men who at no great distance of time and place were raising the chambered barrows, to which reference has already been made.

The beginning of the Neolithic Age is so remote and obscure that attempts to assign it a precise date are apt to mislead. All that we can say with certainty is that physical conditions were then similar to those of modern times, and that the animals associated with man belonged to existing species. We may, however, be sure that some parts of the world developed the

new arts far sooner than others. The relative advance towards civilisation of various countries has always been extremely uneven, favoured districts, such as the great river-valleys, outstripping those which are less advantageously situated. For the same reason the Stone Age came to an end far earlier in some parts of the world than others. While in ancient Egypt bronze was already in use at about 5000 B.C., stone tools were still employed in Great Britain and Northern Europe some three thousand years later. The conversion of the world from the use of stone to that of metal has been proceeding in more remote lands ever since; but in most cases it will never be known when the change actually took place. Even in our own time there are outlying districts where metal is a novelty, though modern commerce is rapidly reducing their number.

The word "prehistoric" has therefore not everywhere the same meaning. In America, it includes the whole period from the remotest times until the voyage of Columbus, and implements of the neolithic type were made by Indian tribes long after the time of the first European settlements. Even the more advanced civilisations of Mexico, Central America and Peru, though they flourished for centuries, can shew no records which, like those of Babylon, Egypt, and China, carry their history back to a remote antiquity. History, in short, begins later in America than in Europe, Asia, and Africa, and the duration of the prehistoric period is therefore proportionately greater.

With the exception of Africa, parts of Asia, and the civilised countries of the American continent, the savage world made known to Europe by the voyages of discovery undertaken from the close of the Middle Ages to the present time has been almost always in the neolithic stage of culture. Even the inhabitants of Mexico and Peru, though in possession of copper and bronze instruments, did not disdain the use of stone and obsidian; and fine examples of their work in these materials may be seen in the American Room. The value of Ethnography to Prehistoric Archæology is therefore very great; the two branches of science are in fact complementary to each other, and Ethnography can frequently throw a most useful light upon archæological problems. For instance, the similarity of the winter houses of Arctic peoples, with their covering of earth, to the chambered barrows (see above, p. 72) suggested the reasonable explanation that these barrows were really survivals of actual houses. It is a common practice among primitive peoples to bury a man in his own house, or, by a development of this idea, in a tomb resembling a house; and it is therefore natural to infer that the

chambered barrows are tombs of this description. In the same way the existing pile-villages of New Guinea and other Asiatic



FIG. 82.—Village built on piles, New Guinea. (*After photo by J. W. Lindt.*)



FIG. 83.—View showing structure of pile-dwelling. (*After photo by J. W. Lindt.*)

islands provide a most life-like illustration of the vanished lake-dwellings of Switzerland (figs. 82, 83). Again, from existing

ethnographical specimens made of perishable materials, such as wood, skin, basketwork, or matting, we may form some idea of the costumes and household utensils of primitive man in Europe which have so completely disappeared. For although differences of temperature involve differences of equipment, the diversities of climate in savage countries are so wide that most of the conditions of life in neolithic Europe must be reproduced in one place or another. And as like needs produce like means of satisfaction, the contrivances with which men in similar stages of progress overcome natural obstacles are in all times very much the same. In all probability, therefore, the resemblance between the perishable productions of the modern savage and those of prehistoric man, which are now lost, was proportionately as great as that which undoubtedly exists in the case of implements of stone and bone which have remained. This similarity between the recent stone industry of savage peoples and that of ancient Europe will be at once obvious to any one who examines the collections in the American Room and the Ethnographical Gallery. Attention may be especially directed to the splendid polished axes and chipped knives from Mexico and Honduras, and to the series of chipped arrow-heads from North America in the table-cases of the room first mentioned; and to the following objects, among others, in the Ethnographical Gallery: the Eskimo implements of stone and bone; the arrows fitted with stone heads from historic North America; the stone clubs, adzes and pounders from the north-west coast of America; the stone rings used by the Bushmen of South Africa to weight their digging-sticks; the stone axes from Fiji; the jade axes from New Caledonia; the stone implements from the Solomon Group; the remarkable basalt ceremonial adzes from Mangaia in the Hervey Group; the mounted adzes of Hawaii and Tonga; the adze blades of less finished character from Samoa; the splendid jade axes and clubs from New Zealand; the rude stone implements from the neighbouring Chatham Islands; the large ceremonial axes from the d'Entrecasteaux Islands near New Guinea; and the stone-headed clubs from the same country. The visitor will also notice many examples of rude pottery, some of which, especially those from prehistoric North America, will recall the work of early man in Britain. Compared with our own neolithic antiquities, nearly all the objects which he will thus pass in review are comparatively modern; and their existence will serve to remind him over how long a time and over what an enormous area the stone age extended. For even

as late as the middle of the eighteenth century one-third of the habitable globe had not advanced beyond it.

The transition between the Palaeolithic and Neolithic Ages is still very obscure. We suddenly find a different culture and different kinds of implements, which indicate a different way of life; but we cannot say exactly how or where the old order gave place to the new. There are some who hold that the cave-dwellers are divided by a great lapse of time from their neolithic successors; that there was an absolute break of continuity, during which the populous centres of the older stone age were deserted; and that the new culture was introduced by the invasion of another race, bringing the elements of a new civilisation in its train. How, it is asked, can the occupation of Western Europe have been continuous when in the caves the remains of the two periods are constantly separated by layers of stalagmite which must have taken an immense time to form? There are others who maintain that since certain physical peculiarities of the cave-races persisted into the Neolithic Age, the breach of continuity can have been only local. It is impossible in this place to enter into the various arguments which have been brought forward in support of these conflicting theories; their wide divergence serves to show how elementary our knowledge of the early prehistoric periods really is. It is, perhaps, possible to establish a compromise between the two views by supposing that while for unknown reasons old settlements were abandoned, and whole communities followed the retreating reindeer to the north, a part at least of the ancient population still maintained itself in Western Europe until it finally amalgamated with the bearers of the new culture, who entered their country from the East. It seems probable that caves were not the only habitations of late palaeolithic man; the remains found at Solutré (Saône-et-Loire) show that there were also settlements in the open air; and it has been conjectured that the valleys and plains of France and Belgium were occupied by hunters whose way of life may have been somewhat different from those of the dwellers in caves. The implements and weapons which they have left behind are in some ways distinct from those of the troglodytes; and it has been suggested that they may have continued the traditions of the implement-makers of the Drift period, devoting their principal attention to the flaking of flint rather than to the carving of bone. On this theory the two industries would have existed side by side, the carving on ivory and bone dying out owing to the disappearance of the reindeer, the flint industry

remaining to develop new forms in neolithic times. Such a hypothesis at least attempts to explain the disappearance of the wonderful skill of the cave-men in delineating animals, an art which for sureness of touch and general truth to nature has seldom been surpassed. The day may still be distant on which we shall be able to substitute for hypothesis a theory confirmed by indisputable facts; meanwhile the search now being carried on for *mesolithic* (Gr. μέσος, middle, and λίθος, stone) or transitional implements, will doubtless shed further light upon the question, though it appears more likely to lead to satisfactory results on the Continent than in England, where convincing evidence in favour of a mesolithic period has hitherto not been forthcoming. It is rather by discoveries made at places like the cavern of Mas d'Azil (Ariège), to the north of the Pyrenees, that our knowledge will be ultimately increased. At present it is commonly supposed that the earliest examples of neolithic workmanship which are known are those discovered in the shell-mounds of Scandinavia.

Cases 125, 126.

The contents of these two cases illustrate the methods adopted by neolithic man for extracting flint suitable for the manufacture of his implements and weapons. The best flint is found in seams or layers occurring at irregular intervals in the chalk, and the finest quality is often at a considerable distance from the surface. The early flint-miners excavated regular shafts in favourable localities, penetrating to depths varying from ten to forty feet. Numerous shafts were usually sunk in close proximity to each other, the material excavated from the fresh pits being thrown into the old; galleries following the seams of flint were then tunnelled from the bottom of each shaft, most of the pits being connected with each other in this way. The implements used in excavating were picks made from the antlers of the red deer, punches and chisels of the same material, and flint tools manufactured on the spot. Some of the galleries being nearly thirty feet in length, artificial means of lighting must have been necessary, and the cup-like objects cut from blocks of chalk exhibited in the cases are in all probability the primitive lamps used by the miners. These are not the only examples of carving in chalk, other pieces of this material having been discovered which have evidently been modelled. A peculiarity about the implements found in and about the flint mines is that hardly any of them

are ground or polished; they are simply chipped into form, often in the rudest manner; and the excavations conducted at the most important mines in England, Grime's Graves, near Weeting, Norfolk, and Cissbury Camp, near Worthing, Sussex, have only yielded two or three ground axes out of many hundreds of implements. The animal remains found in the shafts are those of species belonging to the present geological period. The roughness of the tools and the primitive nature of many forms, which recall types of the cave period, suggest that the Cissbury implements may belong to the earlier part of the Neolithic period, but it must be remembered that the form of an implement is not of itself a criterion of age (see above, p. 70). Very primitive implements are manufactured



FIG. 84.—Miner's pick of deer-horn, Grime's Graves.

to this day in various parts of the savage world, as, for instance, in Australia (examples in Cases 118, 119, and Table-Case 174 in the Ethnographical gallery). Flint mines, like those at Cissbury and Grime's Graves, have been found on the Continent, the best known being at Spiennes, near Mons, in Belgium (see Cases 134, 135).

The upper part of these Cases is devoted to objects from Grime's Graves, Weeting, Norfolk, excavated by Canon Greenwell in 1868.

Top shelf: A number of miners' picks made from antlers of the red deer, one (fig. 84) still retaining the impression of a miner's thumb in the chalky clay which adheres to the surface; and several blocks of chalk from a shaft, showing marks made by such picks and other tools when the pit was originally excavated.

Second shelf: Two of the supposed lamps of chalk, with a fragment of a third; a ground axe-head of basaltic stone of a type usually found in Yorkshire—the only ground implement found in the mine; a bone implement, perhaps a flaking-tool; a bone awl and a small deer-horn pick; water-rolled pebbles, with marks of

abrasion, used as hammers and for flaking; and a large number of chipped blocks, flakes and implements (figs. 85 and 86) from



FIG. 85.—Flint chopper, Grime's Graves.



FIG. 86.—Flint flake, Grime's Graves.

various depths in the shaft, the finer specimens being mounted on a board at the back of the case. At the ends of the shelf are sections and diagrams of the pits at Grime's Graves and Cissbury, showing by means of different tints the various materials used for filling in, as well



FIG. 87.—Chalk lamp, Cissbury.

as the undisturbed strata on either side, with the bands of flint at different levels.

Third shelf: Collection from the flint-mines at Cissbury Camp, near Worthing, Sussex, obtained as the result of excavations made by Lt.-Col. Lane-Fox (afterwards General Pitt-Rivers) in 1868, by Mr. E. H. Willett in 1874, and by an Exploration Committee of the Anthropological Institute of Great Britain and Ireland in 1876.

Among the more remarkable objects are the two *scapulae*, or blade-bones of an ox (*bos longifrons*), mounted on boards at the ends of the shelf and considered to have been used as shovels; a chalk lamp similar to those from Grime's Graves (fig. 87); several implements made from the antlers of red deer including one large pick, and several wedges and punches supposed to have been used for detaching blocks of chalk; and a large number of flint implements (fig. 88), only one of which, an imperfect axe, shows any traces of grinding.

Bottom of the Case: A number of flint implements, ground axes, knives, scrapers, flakes, fragments of coarse pottery, &c., found 1871-78 on the floors of circular hut-sites at Grovehurst, Milton-next-Sittingbourne, Kent. The large number of flakes discovered suggests that this place was a regular factory of flint implements in Neolithic times. On one of the boards



FIG. 88.—Flint implement, Cissbury. $\frac{1}{2}$

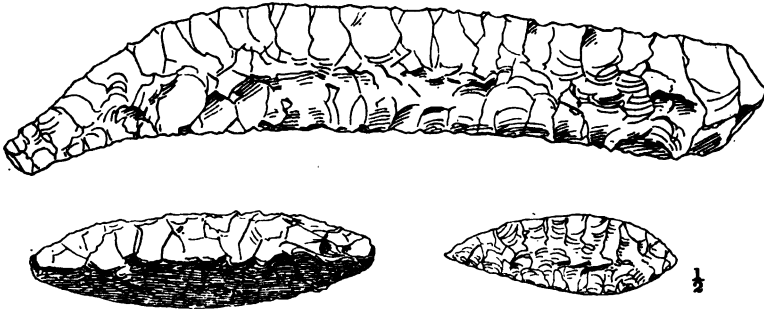


FIG. 89.—Flint knife and points, Grovehurst.

may be noticed a particularly fine flint knife of Scandinavian type, and two delicately chipped lance heads of the same material (fig. 89).

Cases 127, 128.**Neolithic implements from England.**

Top slope: Ground stone and flint axe-heads from various counties. *First shelf:* Similar axes arranged according to counties and from the bed of the River Thames; on the boards are mounted smaller chipped implements, scrapers, and arrow-heads, chiefly from the Yorkshire Wolds, and flint implements perhaps used in flaking ("fabricators") from the same district. *Second shelf:* Larger stone and flint axes from English counties and from the River Thames; on the boards at the back, flint arrow-heads from Derbyshire and from the Yorkshire Wolds.

Bottom slope: Ground axe-heads, &c., from various parts of England.

Cases 129, 130.**Neolithic implements from Ireland, chiefly from the North-Eastern Counties.**

Top slope: Ground stone axe-heads. *First shelf:* Similar axes, and flint arrow-heads (plate 3) of various forms mounted on boards. *Second shelf:* stone axe-heads; pebbles used as hammers and bruised at the ends; pebbles pitted on one or both faces, and perhaps used as anvils in the flaking of flint implements, as seems to have been the case with specimens found at Whitepark Bay (see Cases 132, 133); on boards at the back, worked flints, and rounded and hollow scrapers, chiefly from County Antrim.

Bottom slope: Ground axe-heads chiefly from the north of Ireland.

Case 131.

Neolithic objects found in draining a small lake called Ehenside or Gibb Tarn, near St. Bees, Cumberland. They were discovered by Mr. R. D. Darbishire and others in the vegetable strata which had formed in the bed of the tarn, and are of especial interest from the fact that so many of them are of wood, and have been preserved by the moisture from decay. Stone axes with their hafts complete, such as the one here exhibited, are of extreme rarity (see also cast in Table-Case B).

Top part of the Case: A curious paddle-shaped object of oak with three prongs, a small paddle, the pierced oak haft of an axe, and a mallet; with casts of other wooden objects discovered at Ehenside, but most of which are not in the Museum—viz., a remarkable curved implement or weapon shaped like a Cupid's bow, a paddle-shaped club, and an object with a flat rectangular

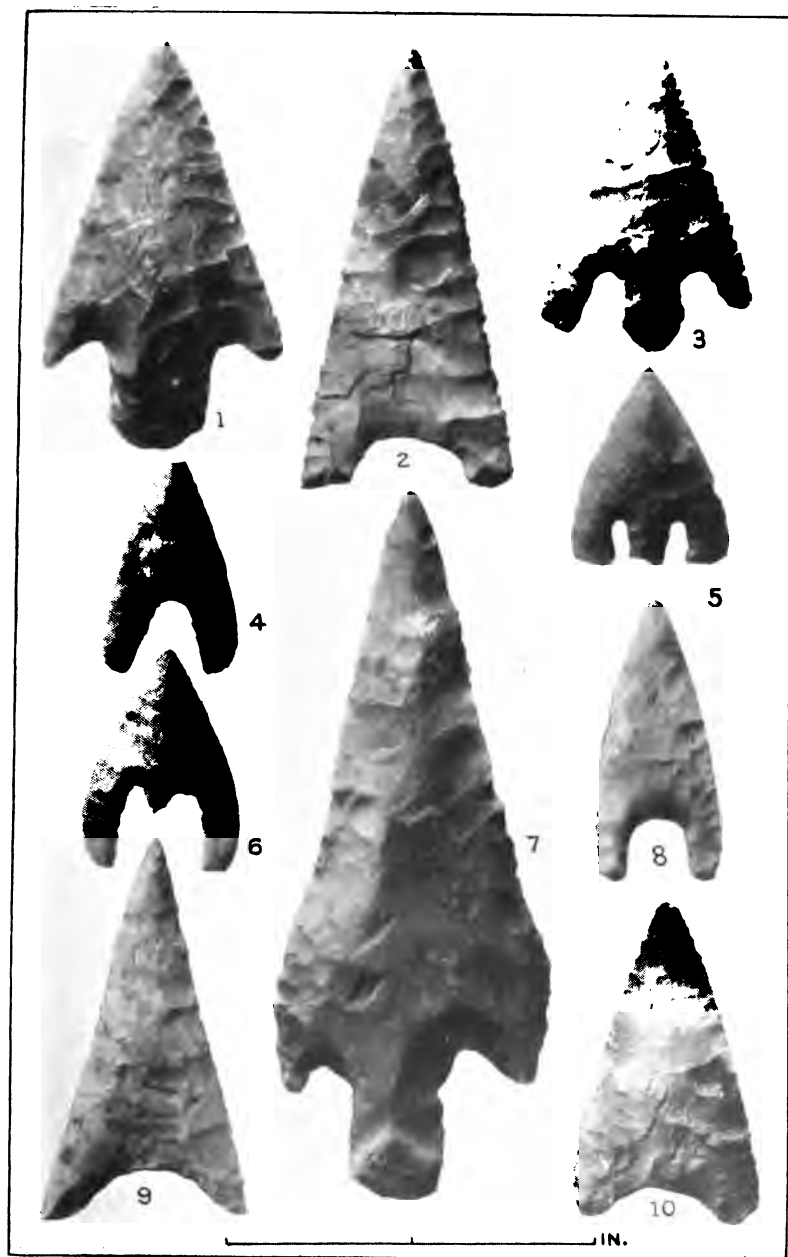
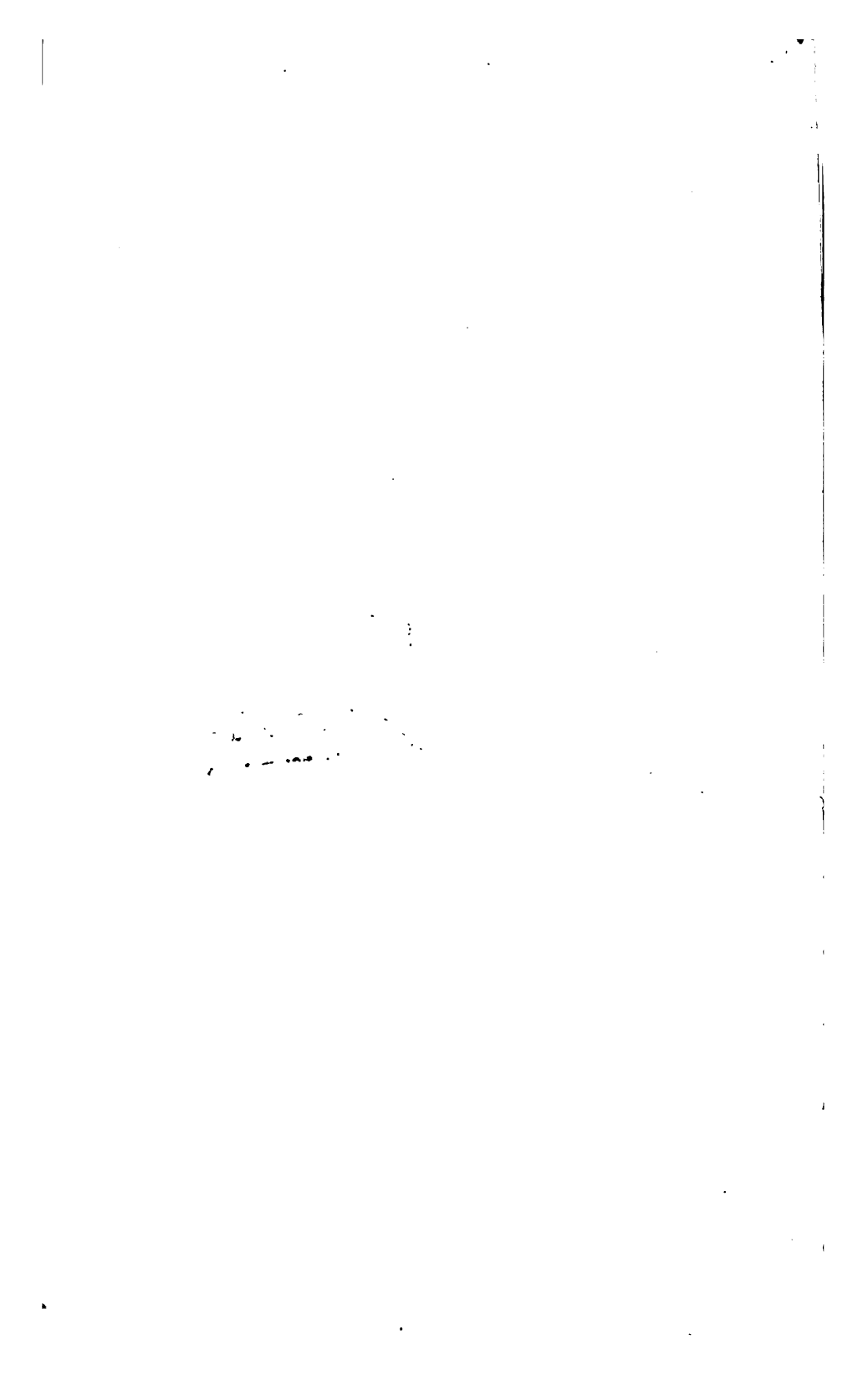


PLATE 3. NEOLITHIC ARROW-HEADS OF FLINT, IRELAND.
 (Cases 129, 130, *see* p. 82.)



head which may be a club or an unfinished axe-haft, the hole intended to receive the stone head not having been bored: the broken original of this object is preserved in water on the bracket below. On the shelf are six axe-heads of felstone or other pale green stone, three completely ground, some of remarkable size and weight (fig. 90). On the bracket to the left, below the shelf, are a ground stone axe-head, and (in the glass bottle) the original

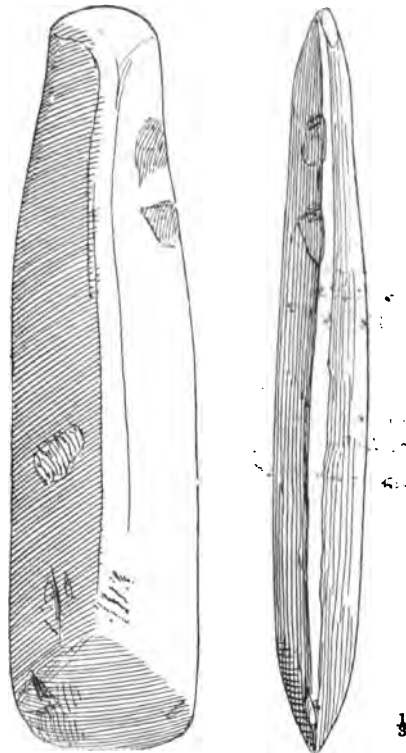


FIG. 90.—Stone axe-head, Ehenside Tarn.

beechwood haft with which it was found. On the bracket to the right, in a glass bottle, is the original club or unfinished axe-haft of which a cast is exhibited above.

Bottom of the Case: A number of fragments of coarse pottery vessels, possibly of the Neolithic period, a piece of a shale vessel turned on the lathe, dating from Roman times, and a block of stone used for grinding stone axe-heads. Other grindstones from the same site are exhibited in the end of Table-Case C in the room below.

Cases 132, 133.

Top slope: Ground stone axes from Scotland.

First shelf: A collection from the Neolithic settlement at Whitepark Bay, near Ballintoy, five miles from Giant's Causeway, County Antrim. The implements, &c., were found not merely in the surface sand, but in a dark layer at a considerable depth. This evidently represented the ground level when the site was occupied in Neolithic times, and upon it were found traces of dwellings marked by circles of stones. The pottery discovered was of very coarse texture, and none of the implements were polished, a fact which may suggest that they were made at an early period in the Neolithic Age. Among the more remarkable objects discovered are the large pebbles hollowed or pitted on one or both faces like others from Ireland in Cases 129, 130.

These are considered by the discoverer, Mr. W. J. Knowles, to have been used not as hammers, but as anvils on which the ends of flint implements were placed during the process of chipping, the cavities being formed by the impact of the implements under violent and constantly repeated blows. The point is interesting, because it suggests that the somewhat similar hollowed pebbles found in various palæolithic caves (see examples exhibited in Cases 111, 112, and fig. 38), and usually held to be mortars for grinding paint, may also have been used as anvils. On the same shelf are also shown hammer-stones of flint, quartzite, and other hard stones, bruised at the ends, hollow scrapers (fig. 91), and three implements with an ochreous crust showing signs of re-chipping; on boards at the back are flint flakes, scrapers, &c., fragments of rude pottery vessels showing ornament made by impressing cords in the wet clay, and bones and teeth of animals belonging to the present geological period.

Second shelf and bottom of case: Ground axe-heads and pierced hammer-stones from other parts of Ireland.

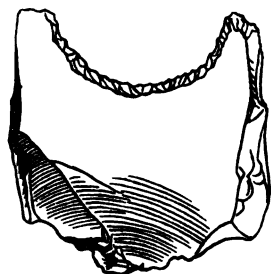


FIG. 91.—Hollow scraper of flint, Ireland.

Cases 134, 135.

Neolithic Implements from the Continent.

Top slopes: Ground stone axes from Brittany and Normandy.

Middle shelf: Ground stone axes and pierced axe-hammers from Germany, Russia, and Finland, the Russian examples principally from the neighbourhood of Kieff. On the boards at the back, casts

of ground stone implements and fragments of pottery from the Netherlands, and flint flakes and arrow-heads from Poland.

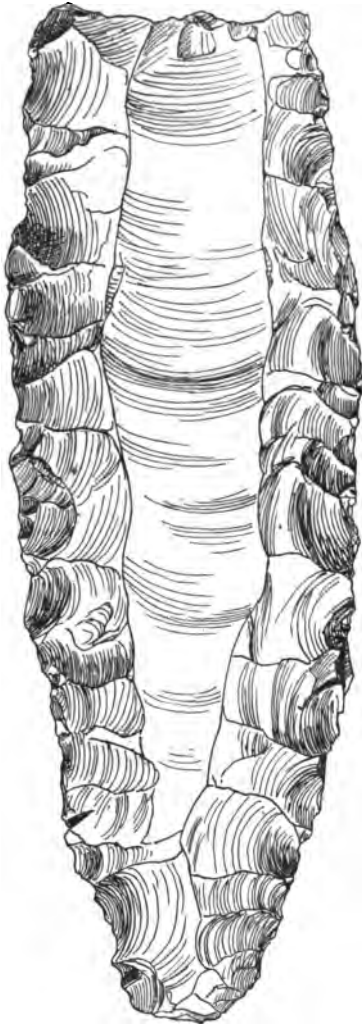


FIG. 92.—Flint core, Pressigny.

Lower shelf: Ground stone axes from Germany, Austria-Hungary, the Netherlands and Belgium. From the last come a broken pick made from an antler of a red deer, and roughly chipped unground

flint tools, found at Spiennes near Mons, where mines for working flint were discovered similar to those at Grime's Graves and Cissbury in England (see Cases 125, 126).

Lower slopes: Continuation of the series from Spiennes and Mons, Belgium; ground stone axes from Germany. It may be remarked that several axes in these Cases found in Russia, Holland, and North Germany are of the types so frequently met with in the Scandinavian countries (see Cases 141-6).

Case 136.

Neolithic Implements from France.

(See also upper slopes of Cases 134, 135.)

Upper slope and first shelf: Ground and unground flint and stone axes from various localities; on boards at back, scrapers, worked flakes, &c., from the Orléannais and Poitou.

Second shelf: Ground and unground axes of larger size from different sites; on boards at back, small ground stone axe-heads from Auvergne; chipped flint arrow-heads; chipped flint implements from Poitou.

Lower slope: Ground and unground flint and stone axes, cores, &c.

Case 137.

Neolithic Implements from France.

The greater part of this Case contains specimens of the heavy cores of yellow chert (fig. 92) from Pressigny-le-Grand (Indre-et-Loire), locally known, from a supposed resemblance to pounds of butter, as *livres de beurre*, with flakes from the same locality. On the second shelf are a few hammer-stones of flint and quartz from Pont-sur-Vanne, Dept. Yonne, &c. On the boards at the back of the middle shelf are small ground stone axe-heads, chipped flint arrow-heads, &c., from Brittany and other parts of France. Other Neolithic implements forming part of the Morel collection of pre-historic antiquities from the district of Champagne are temporarily exhibited in Wall-Cases 63, 64 and Table-Case N in the Gaulish Section of the Central Saloon.

Case 138.

A mixed collection of the Neolithic and Bronze Ages, two objects, a fish-hook and spear-head, being made of bronze, found in the caves of Gibraltar. It consists of a number of fragments of coarse pottery vessels, many with impressed geometrical ornament, ground stone axes, bone awls and pins, fragments of shell armlets, and flint flakes. On one of the boards are mounted some of the

bones of animals discovered in the cave; these belong to the present geological period.

On the bottom of the Case are flint flakes, fragments of shell armlets, &c., from a cave at Alhama, Granada, Spain; and a pottery vessel of comparatively fine workmanship with projections on the sides, found at Cueva Lobrega, Old Castile. Other Neolithic objects from south-eastern Spain will be found in Cases 38, 39 and Table-Case K in the room below, together with antiquities of

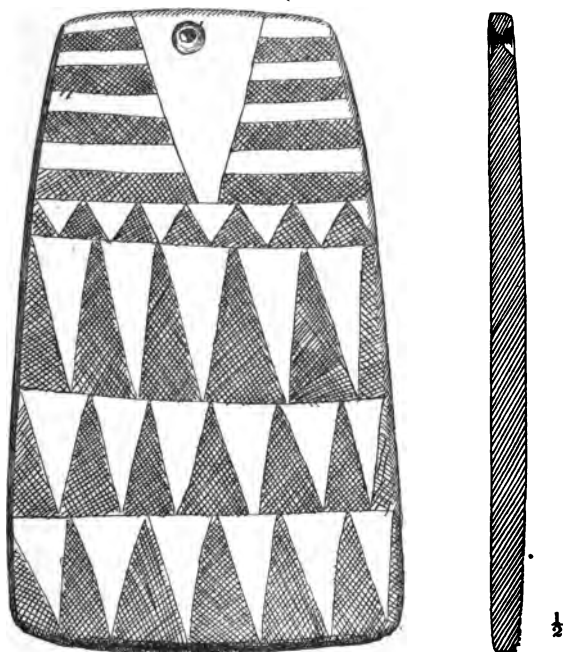


FIG. 93.—Ornamental stone axe-head, Portugal.

the Bronze and early Iron Ages from the same locality, from which it was considered undesirable to separate them (see p. 102.)

Cases 139, 140.

The Iberian Peninsula, Greece, and Italy.

Top slopes: Ground stone axes, casts of axes and other objects, flakes, fragments of incised pottery, from dolmens and caves in Portugal; some of the implements have incised geometrical designs (fig. 93) resembling those of the Bronze age, and may possibly belong to that period.

First shelf: Ground stone axe-heads and pierced mace-head from Asia Minor; ground stone axe-heads, grooved axe-hammers, &c., from Italy and Sicily. On the boards at the back, worked flakes, chipped arrow-heads, ground stone axes, &c., from Italy and Sicily.

Second shelf: Ground stone axe-heads, pierced axe-hammers, &c., from Asia Minor, and the Greek Islands; ground stone axe-heads, hammers, and whetstones, from Greece. On boards at the back, obsidian flakes, cores, &c., and ground stone axes, from Greece, Asia Minor and Crete. The exceedingly small size of many axe-heads (fig. 94) from Greece and the islands is worthy of remark. Some of them would make inadequate tools, and may have been ceremonial objects.

Bottom slopes: Ground stone axes from Spain (fig. 95).



FIG. 94.—Diminutive celt, Sardis.

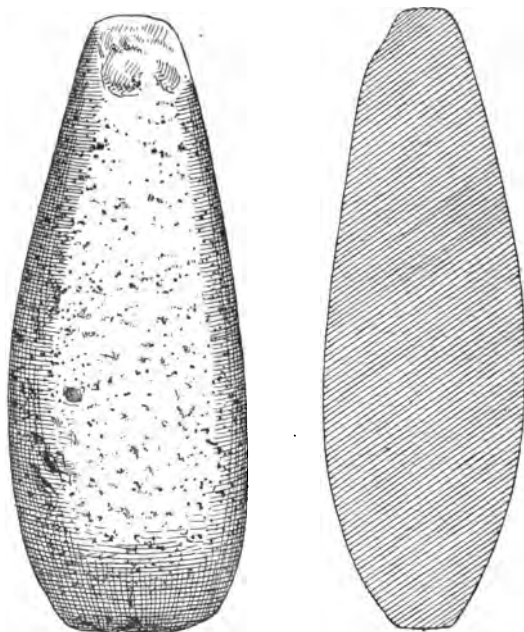


FIG. 95.—Stone axe-head, Spain.

Cases 141-146.**Scandinavia.**

The Stone Age in Northern Europe is supposed to have come to an end *circa* 1800 B.C., about the time of its termination in our own country. The Neolithic industry of Scandinavia, when it had passed the primitive stage represented by the implements of the kitchen-middens (see Case 120), assumed a marked individuality, and developed a great variety of forms. The



FIG. 96.—Axe-head with hollowed edge, Denmark.



FIG. 97.—Flint chisel, Denmark.

later products of the Scandinavian countries are among the finest examples of flint-chipping in existence. (See especially the knives in Cases 143, 144, and the objects in Table-Case L, in the room below.) They are only surpassed by the marvellous chert knives of pre-dynastic Egypt. (See Cases 150, 151.)

Cases 141, 142.

Top slopes and first shelf: Partially ground flint axe-blades, some with gonge-like edge (fig. 96), of flat form and rectangular

transverse section, a few axes, adzes, &c., of ground stone, hammer-stones, &c., from Denmark.

Second shelf: similar flint axe-heads from Sweden; on the boards at the back, flint flakes, cores, and scrapers from Denmark and Sweden.

Bottom slopes: larger ground stone axes from Denmark.

Cases 143, 144.

Top slopes: Pierced axe-hammers of ground stone from Denmark.

First shelf: Long flint chisels, some ground, some only chipped (fig. 97); grooved stone hammer-heads, and pierced stone axe-hammers from Denmark. On the boards at the back, flint chisels and knives, many of them remarkably finely chipped.

Second shelf: Flint knives, and heavier stone axe-hammers from Denmark.

Bottom slopes: Flint axe-heads from Denmark.

Cases 145, 146.

Top slopes: Larger flint axe-heads from Denmark.

First shelf: Pierced axe-hammers of ground stone, some unfinished (fig. 98), from Denmark and Norway; examples of oblong ground flints grooved round the edges and with marks of blows on their flat sides, held to have been used as strike-a-lights in the early Iron Age in Scandinavia, and here exhibited for comparison with objects of the Neolithic Period. On the boards at the back, finely chipped crescent-shaped flint implements, probably sickles, from Denmark, Sweden, and Norway; spear-heads, some with serrated edges, from Denmark; whetstones, recalling those of the Bronze Age (see Table-Case L in the room below), and those used by the Eskimo (see Ethnographical Gallery, Table-Case No. 187); stone spindle-whorls, amber beads, etc., from Denmark.

Lower slopes: Stone and flint axe-heads from Sweden and Denmark.

South and West Africa.

With the exception of Egypt, Africa appears to have passed directly from the use of stone to that of iron, there being apparently no traces of an African bronze age. It is impossible to say at what time iron implements superseded those of stone in uncivilised regions, but the change must have taken place earlier in the eastern half of the continent than the west, for in early times the movement of civilisation in Africa undoubtedly took a westerly direction. When the great era of African discovery opened in the fifteenth century, the natives

of the extreme west were already in possession of iron. Only among the Hottentots and Bushmen in the south did stone implements and weapons continue in general use down to modern times (see examples in the Ethnographical Gallery, Wall-Case 53, Table-Case 179);—in other parts they were regarded as thunderbolts, and held in superstitious veneration.

Case 147.

In the *upper part of the Case*, chiefly mounted on boards, are chipped flakes, scrapers, arrow-heads, and fragments of rude

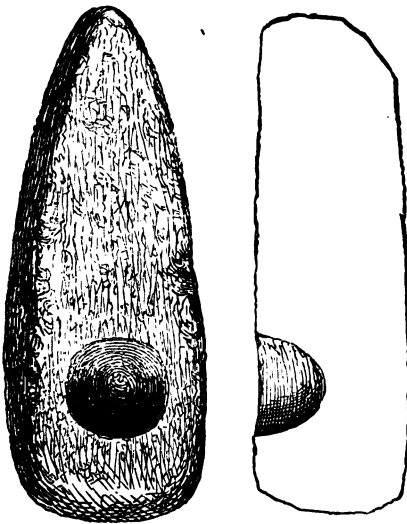


FIG. 98.—Unfinished axe-hammer, Denmark.

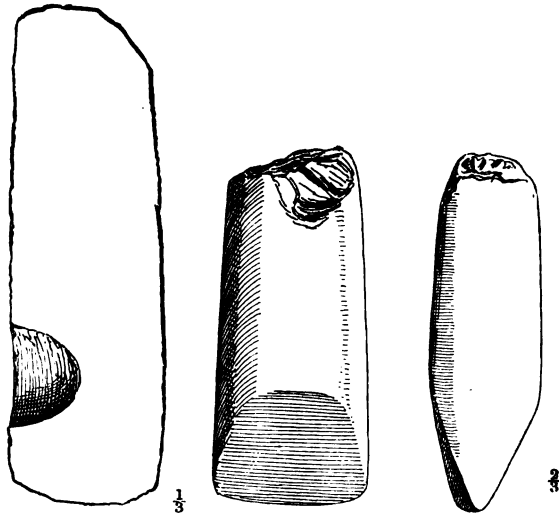


FIG. 99.—Cylindrical stone implement, Gold Coast, W. Africa.

pottery, etc., from the Cape Flats, Zululand, the Transvaal, and Griqualand East; ground stone axes, etc., from the Gold Coast (fig. 99).

Lower slopes: Rudely chipped stone implements, some of palæolithic appearance, from Cape Colony and the Transvaal, with pierced stone discs and other implements from Cape Colony.

Cases 148, 149.

Top shelves and slopes: Selected implements (plate 4) obtained in Somaliland in 1894 and later, by Mr. H. W. Seton-Karr. The form of the larger implements is strikingly similar to that of the

specimens from the River Drifts of Europe (see Cases 100-110). They were not, however, found under similar geological conditions, but on the slopes of a hill near the Issutugan River, having been apparently exposed by the action of the rain. Bones of extinct animals were also absent, as is usual in Africa, where such remains are recorded in conjunction with stone implements only at Lake Karâr in Algeria. The smaller implements are found over a wider area, and for them palaeolithic age has not been claimed.

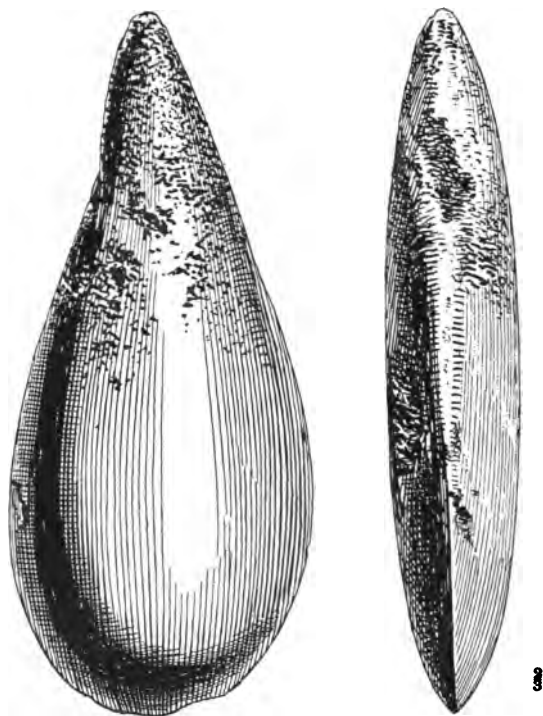


FIG. 100.—Haematite axe-head, Upper Congo.

Case 148. *First shelf:* Ground stone axes and casts of axes, flakes, &c., from Algeria; on boards, further series of smaller implements and flakes from Somaliland; chipped stone implements from Cape Colony. *Second shelf:* Remarkably fine ground haematite axes (fig. 100) from Mount Tina, near the Bomokandi River, in the north-east of the Congo Free State, and from the district between Rohl and Makraka, further to the north; these axes are regarded by the present natives as thunderbolts, and considered as remedies for sickness (*cf.* p. 72, and Table-Case L); small



PLATE 4. CHERT IMPLEMENTS OF PALAEO-LITHIC FORMS, SOMALILAND.
(Cases 148, 149, *see* p. 91.)

chipped implements and cast of a larger specimen of palaeolithic appearance from Palestine; on boards, chert flakes from Wadi Magarah, Mount Sinai, and from a cave near Bethlehem; flakes and implements, perhaps sickle blades, from Tell el-Hesi, Palestine. *Bottom*: Rudely chipped quartzite implements from the country between Matadi and Stanley Falls, Congo Free State; on board, further flakes and small implements from Somaliland.

Case 149. *Second shelf*: Chert flakes, hammer stones, and fragments of pottery from Wadi Halfa; chipped implements of a dark red-brown colour from the desert behind Lower Ombros, Egypt; on board, implements and cores from Beyrât, Syria. *Bottom slopes*: Further implements from Lower Ombros, Egypt; chipped chert implements of palaeolithic form from the desert west of Thebes.

Egypt.

It is now commonly agreed that the north-east corner of Africa was occupied by man at a very remote period, and that Egypt had a palaeolithic age. At that distant time the fertile country was not, as at present, confined to the valley of the Nile. Districts on both sides of the river, which are now barren, then received a plentiful rainfall, and were covered by a profuse vegetation. Most of the Egyptian implements which resemble those found in the river drifts of Europe have been picked up on the surface of the desert, and as a rule there is little to determine their age other than their "palaeolithic" form and the condition of their surface. Flint long exposed to the scorching sun of Egypt becomes tinted in many gradations of colour varying from a pale buff to deep orange brown, but it would be hazardous to assume a connection between the antiquity of an implement and the comparative intensity of its discoloration. More reliable evidence of age is afforded by General Pitt-Rivers' discovery in 1881 in the neighbourhood of Thebes of flint tools, undoubtedly chipped by man, lying embedded in indurated gravel of a very ancient formation, and by more recent discoveries of implements in similar positions by Prof. W. M. Flinders Petrie. The one thing needful, however, the presence with the implements, in an undisturbed stratum, of remains of animals belonging to species now extinct, has not yet been produced from Egypt. The tendency of ancient forms to persist through later periods should therefore caution us against assigning *all* Egyptian finds of palaeolithic appearance to the age of the European drift; for, in the words of General Pitt-Rivers: "Flints found on the surface of the soil cannot be

legitimately disconnected from flints of the surface period except by form; and form alone is not conclusive in determining date."

The use of stone implements in Egypt was not confined to the prehistoric period which ceased about 5000 B.C., but was continued for domestic as well as ceremonial purposes into historical times. Certain forms of stone axes have even been associated with particular dynasties. In Case 152, shelf 2, are exhibited axes of characteristic shape ascribed to the 12th dynasty and found at Kahun; they are similar in shape to bronze axes from the same site, and it is supposed that the one form was derived from the other.

Perhaps the finest chipped flint implements in existence come from Egypt, where they were produced in the period immediately preceding the dawn of history. Several of these may be seen in Cases 150, 151, while others are exhibited in the Department of Egyptian and Assyrian antiquities. Remarkable examples of the flint-workers' skill are also the chipped bangles produced from a thin disc by perforating it in the centre, an operation extremely liable to result in the fracture of the whole. A series illustrating the manufacture of such bracelets will be seen at the end of the second shelf of Case 150. It may be added that ground axes are rare in Egypt, the great majority being simply chipped.

Cases 150, 151.

(*Note*.—Another series of prehistoric remains from Egypt is exhibited in the Third Egyptian Room.)

Top slopes: Flat utensils of schist, some intended to represent animals, and considered to be palettes on which colours were rubbed. These objects belong to the close of the prehistoric period.

First shelf: Finely chipped chert knives of various forms from different sites, belonging to the late prehistoric period (figs. 101, 102); chipped lance-heads with fish-tail ends from Abydos and Hâû; it has been suggested that these were used to hamstring animals; chert bangles from Hâû; scrapers, &c., from various places; on boards, arrowheads, implements and flakes from the Fayûm, the neighbourhood of the pyramids of Gizeh, and other sites.

Second shelf: Chipped chert implements, flakes, &c., from Coptos and Abydos; arrow-heads from Tuna; chert sickle-blades from Akhmîm and Karnak; two small polished axe-heads pierced for suspension and worn as charms (see p. 72 and Table-Case L below); ground stone axes from Coptos; chipped implements from Abydos. On boards, series to illustrate the method of manufac-

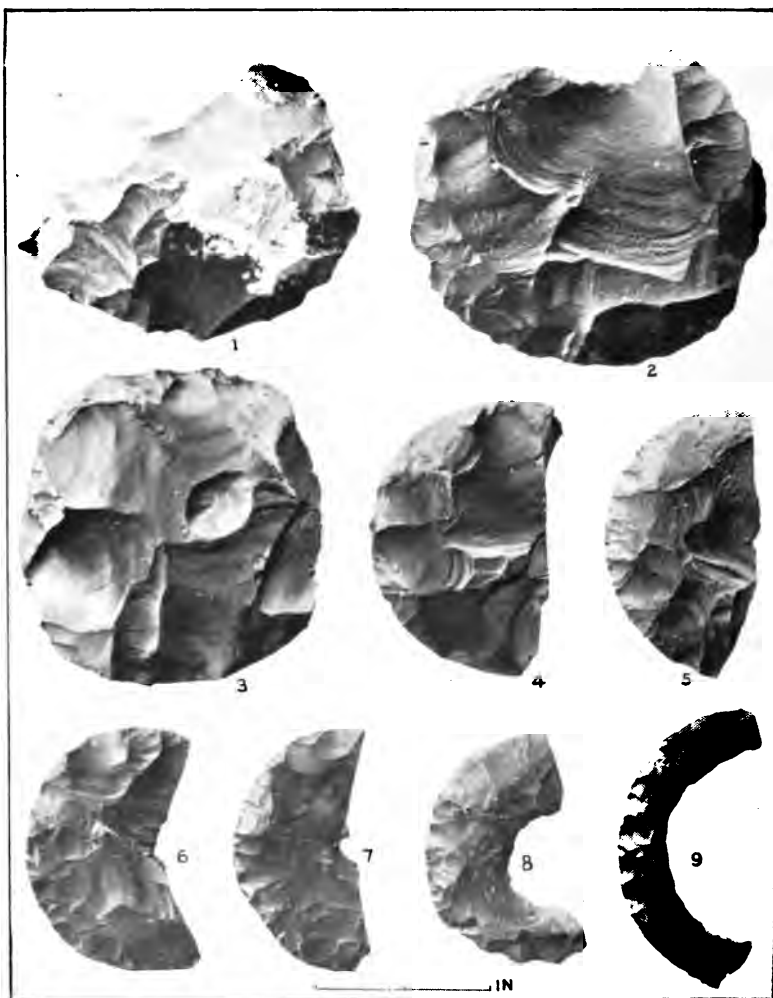


PLATE 5. STAGES IN MANUFACTURE OF CHERT ARMLET, NILE VALLEY.
(Case 150, see p. 95.)

turing flint bangles from the Wadi esh-Sheikh, half-way between Cairo and Siût (plate 5); chipped chert implements, flakes, &c., from Thebes and Abydos; flakes and sickle-blades from Lower



FIG. 101.—Chipped knife of chert, Sheikh Hamadeh, Egypt.

Egypt; chipped implements, ground stone axes and flakes from various sites.

Lower slopes: Series of chipped chert implements from the Wadi esh-Sheikh and the Wady Sagûr, in the desert to the east of



FIG. 102.—Chipped knife of chert, Tell el-Amarna, Egypt.

the Nile, where they were discovered by Mr. H. W. Seton-Karr in 1896 (plate 6). The series contains, in addition to the bangles on the second shelf, axe-like implements, knives, cores, and clumsier tools considered to have been used for agricultural purposes.



FIG. 103.—Crescent-shaped implement, Upper Egypt.

Though some of the specimens have analogies with those of the Drift period in Europe, the majority evidently belong to Neolithic and dynastic times. They were discovered on the surface, round shallow pits from which the chert had been extracted, situated in

terraces descending from the plateau to the dry valleys, and on ledges on the sides of the cliffs. The pits often surrounded a central working-place where the raw material was chipped into shape.

Case 152.

Egypt, chiefly of Dynastic Times.

Top shelf: Chipped implements from Luxor, crescent-shaped implements from Bét Khallâf, Upper Egypt (fig. 103). On boards, flakes and minute worked points from Helwân. These should be

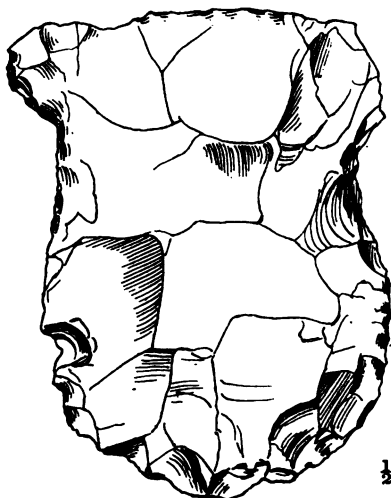


FIG. 104.—Axe-head of chert, Kahun, Egypt.



FIG. 105.—Stone axe-head, Kahun, Egypt.

compared with the small flints from Hastings in Case 120, those from the hills of East Lancashire in Table-Case M, those from Spain in Table-Case K, and those from India in Wall-Case 43 below. For a few remarks on the curious facts about the distribution of these so-called "pygmy" flints, see p. 110, below. Various suggestions have been made as to their use, some supposing that they were used as arrow-points, others as lateral barbs for harpoons (*cf.* Scandinavian harpoons in Table-Case L, and fig. 118), others as fish-snags, borers, &c.

Second shelf: Limestone mace-head, chipped chert knives and axe-heads, and chert and stone axes of characteristic form (figs. 104, 105) from Kahun, attributed to the XIIth dynasty (close of the third millenium B.C.); chert scrapers, &c., from a tomb of the



PLATE 6. BROKEN IMPLEMENTS, SHEWING UNEQUAL WEATHERING, EGYPT.
(Cases 150, 151, see p. 95.)

4th dynasty at Médum. On boards, chert knives, scrapers and flakes from tombs of the first two dynasties at Abydos, some accompanied by copper implements and models of implements, the whole excavated by Professor W. M. Flinders Petrie, and given by the Committee of the Egypt Exploration Fund; chipped chert implements from Medinet el-Fayûm. The resemblance of a common form of scraper (fig. 106) to some from the French caves should be noticed.

Bottom of Case: chipped implements from Abydos, &c.

Japan.

The remains of the Stone Age in Japan have been chiefly found near the coast, and in those parts of the islands which are known to have once been inhabited by the ancestors of the present Ainu of Yezo and Saghalien. The most primitive implements are those discovered in shell-mounds, resembling the "kitchen middens" of Europe (see above, p. 56), where they occur in association with broken pottery and remains of the deer, boar, fox and bear, the hollow bones being frequently broken, probably with a view to the extraction of the marrow. Some of the designs impressed upon the pottery suggest those which the modern Ainu still carve on their wooden utensils or sew on their woven garments. The formation of these shell-mounds must have extended over a long period, for they are found not only at many points on the coast of the main island, but also far south in Kyûshiû, where the Japanese crossed from the mainland at an unknown time before the Christian era. The invaders were from

the first in possession of bronze, while their pottery was quite different in character from that of the kitchen-middens. As they steadily drove the Ainu northwards, the more southerly shell-mounds may be considered to date at least from several

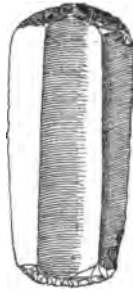


Fig. 106.—Chert scraper, early dynastic tomb, Egypt.



Fig. 107.—Part of "thunder-mallet," Japan.

centuries B.C. Those further north may be proportionately less ancient as they approach the district still occupied by the Ainu, that people having learned the use of metal only in comparatively modern times.

Case 40.

Top slope: Fragments of pottery with impressed designs from shell-mounds in the province of Musashi; example of the curious stone objects, called by the modern Japanese "thunder-mallets" (fig. 107), found on the same site, and perhaps a symbol of authority.

Middle shelf and boards at back: Ground stone axes, chipped

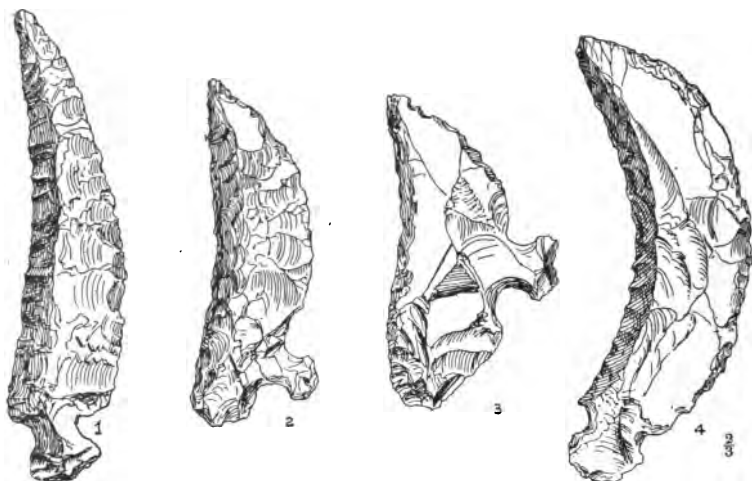


FIG. 108.—Chipped stone knives, Japan.

knives, arrow-points, drills, etc, chiefly from Hakodate, Yezo; especially characteristic are the small knives with projecting knobs at the butt or back, probably for attachment to a wooden handle (fig. 108).

Bottom: Pottery with impressed designs; stone axe-heads from various sites; fragments of stone, "thunder-mallets"; obsidian and chert implements, arrow-points, and flakes from shell-mounds at Otaru, Yezo.

India.

The geological evidence afforded by the formations in which chipped implements of palaeolithic type have been discovered may be held to justify the existence of a palaeolithic age in

India. Mr. R. Bruce Foote has shown that in the valley of the Sabarmati River in Gujarat a vertical distance of about 200 feet separates the neolithic implements found on the surface from those of more primitive form buried beneath the alluvium of an ancient river system below. Moreover, the nature and depth of the intervening deposits justify us in assigning a very great antiquity to the implements which underlie them. Similar though less perfect evidence is supplied by the discovery of rudely chipped tools of quartzite embedded in the laterite (red ferruginous clay) which clothes the flanks of the Eastern ghats in the Madras Presidency. To these beds a marine origin has been attributed by some geologists; and if this theory is correct, their presence in some cases at an elevation of several hundred feet above the present sea-level would indicate that the coast has been raised to this height since the time when the men who made these rude implements occupied the district. Other authorities, however, consider the laterite to be a fresh-water deposit. The presumption of high antiquity on geological grounds is confirmed by the forms of the implements themselves, which often strikingly resemble those of the ancient river drifts of Western Europe. It is much to be regretted that these Indian strata have hitherto afforded no example of primitive implements lying in undisturbed association with the bones of extinct animals.

The Neolithic age in India is represented by discoveries from various parts of the peninsula, showing that the culture of this period was very widely distributed. Attention may be especially directed to the comparatively frequent use of hard stones, such as jasper, from which very small flakes were struck; the neighbourhood of Jabalpur has been especially prolific in these remains, which are remarkable for the high proportion borne by the cores to the flakes discovered. The collection is not rich in neolithic implements from the countries adjacent to India; but it contains a few specimens from Burmah, the Malay Peninsula, Cambodia, and Java. Among these the Malay examples exhibit marked peculiarities, shared by those from the neighbouring islands. For example the chisel-like implements from Negri Sembilan are evidently related to others found in Java and Sumatra. The stone implements of the Malay peninsula are usually ascribed not to the primitive negro tribes of the interior, nor to their ancestors, but rather to peoples of higher civilisation who entered the country at a later period.

Cases 42, 43.

The central part of the cases is largely occupied by quartzite implements of palaeolithic form from the laterite deposits in the Madras, Nellore and North Arcot districts of Southern India, and by collections of rudely-chipped implements from Mirzapur and Raipur in the North. The objects illustrated on plate 7 all find a parallel in the products of the river-drift in this country and may well belong to the corresponding period. With the wedge-shaped implement (No. 1) should be compared the flint specimen in Case 105, from the contorted drift at Stoke Newington, London; No. 2

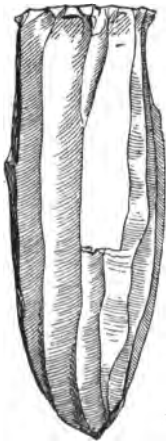


FIG. 109.—Core, Rohri Hills, Indus.

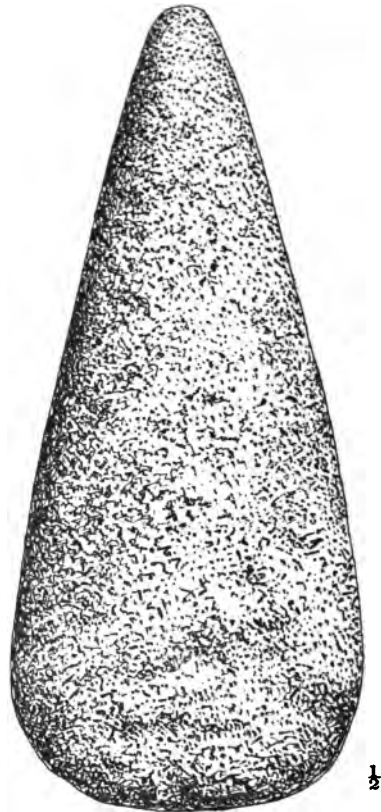


FIG. 110.—Stone axe-head, North-West Provinces, India.

is of the common pear-shaped type, and No. 3 closely resembles several examples in flint exhibited in Case 103, and found in drift gravel at Santon Downham and other sites in Suffolk (fig. 10). On boards at the back are flakes and cores from Rohri and Sakkar (Sukkur) on the Lower Indus (fig. 109). In the bottom of the case are chipped and ground stone axe-heads, hammer-stones, etc., from Bellary in the Madras Presidency.

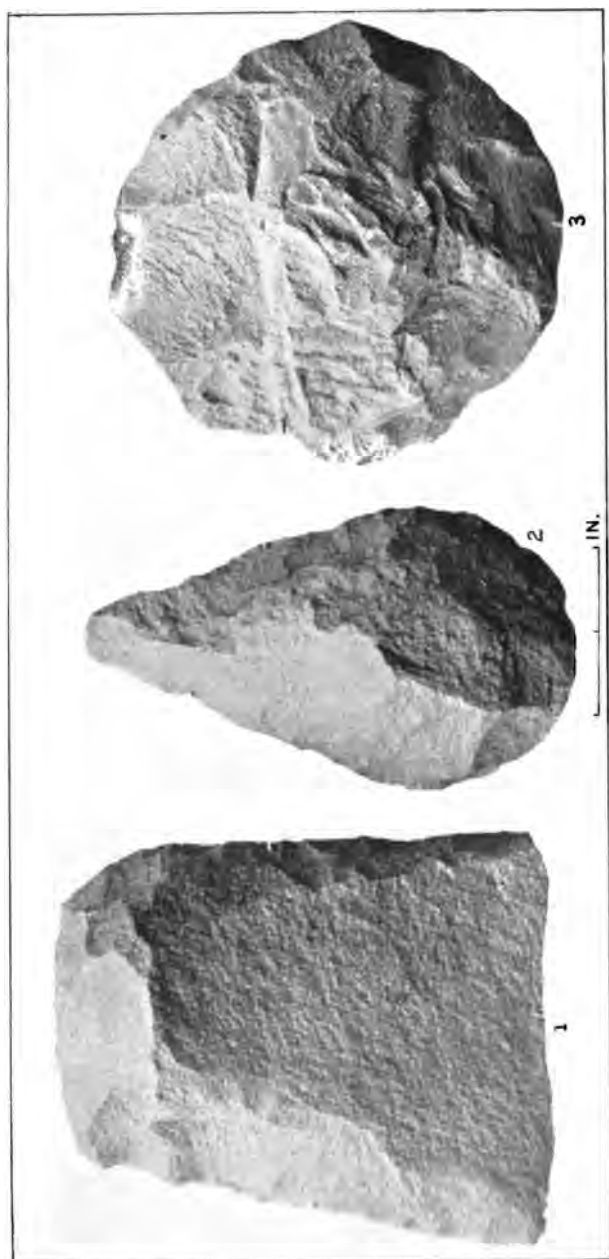


PLATE 7. QUARTZITE IMPLEMENTS FROM LATERITE BEDS, MADRAS.
(Cases 42, 43, *see* p. 100.)

Cases 44, 45.

These cases are principally filled with chipped and ground stone axe-heads, hammers, and other implements from the Kaimur Range in Central India, the North-West Provinces, and the Shevaroy

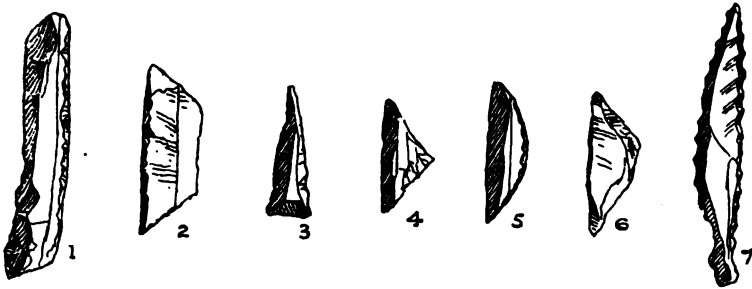


FIG. 111.—Pygmy flint implements, Vindhya Hills.

Hills in the Madras Presidency (fig 110). On the boards at the back are flakes and cores of chert, jasper, chalcedony, &c., from

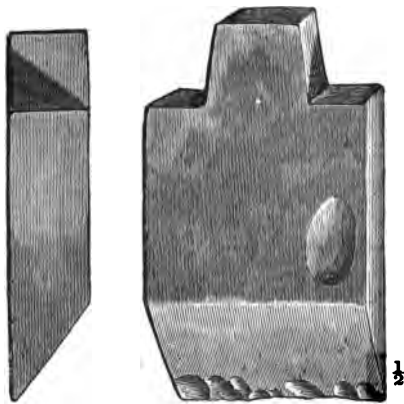


FIG. 112.—Stone adze-blade, Burmah.

the Vindhya Hills, and from Jabalpur in the Central Provinces. Some of the worked flakes are exceedingly minute (fig. 111) and show forms characteristic of the so-called "pygmy flints," found in widely distant parts of the world (see below, p. 110).

Cases 47, 48.

Rudely-chipped stone axes, net-sinkers, and arrow-heads from Kamtchatka; ground and polished axe-heads from China, chiefly from Momein, Yunnan; axes and adzes, beads, bracelets of shell, fish-hook and spear-point of bone from the Great Lake, Cambodia, ground stone adze-heads from Burmah (fig. 112); thin ground axes, some of curved outline, two made of polished agate, from

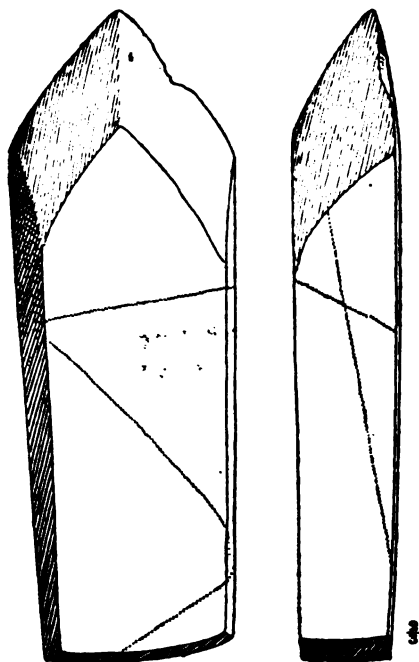


FIG. 113.—Stone implement, Malay Peninsula.

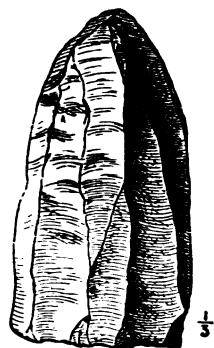


FIG. 114.—Flint core, Denmark.

Java; ground axes, chisel-like implements (fig. 113), and part of a stone mallet for making bark-cloth from Java, Sumatra, and the Malay Peninsula.

Table-Case K.

In part of this case are exhibited objects from the district between Almeria and Cartagena in south-eastern Spain, excavated by MM. Henri and Louis Siret in 1881-1887. This collection is especially interesting because it covers the period of transition

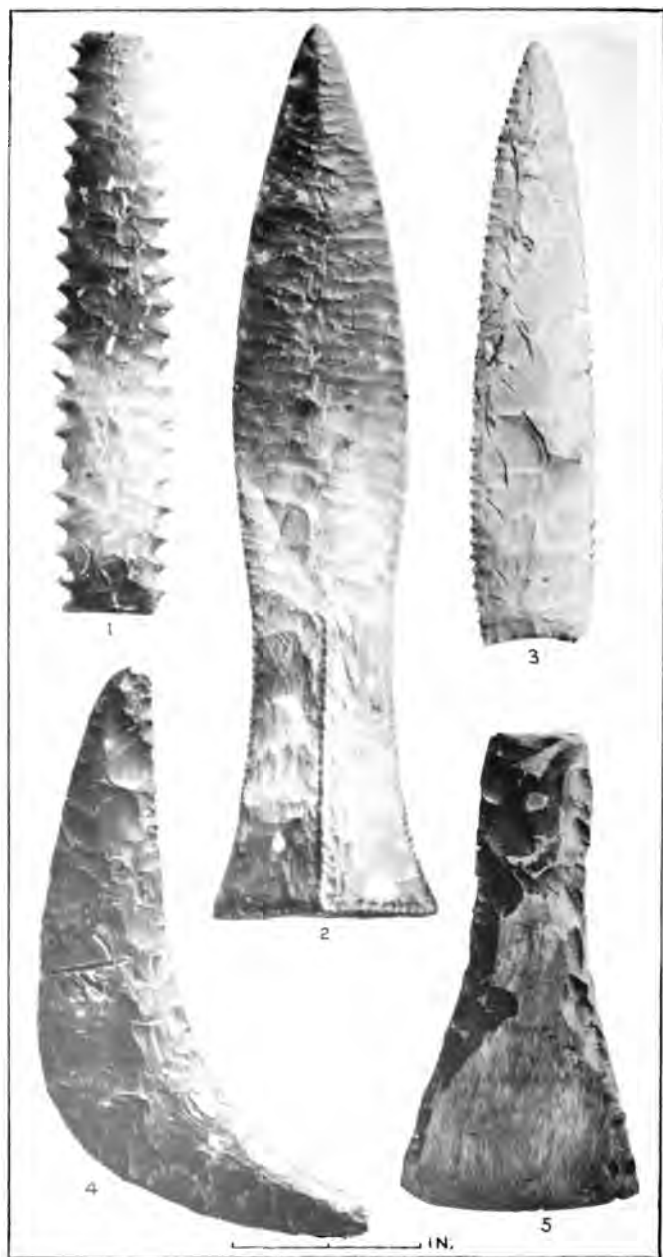


PLATE 8. NEOLITHIC FLINT IMPLEMENTS, DENMARK.
(Table-Case L, *see* p. 103.)

between the Stone and Bronze Ages, and it is therefore only with the beginning of the series that this Guide is concerned. The objects were found at a slight depth beneath the surface, usually in graves containing several skeletons, and bounded by polygonal enclosures formed of stone slabs. The most characteristic specimens discovered were ground stone axes, usually of diorite, flint knives, scrapers, piercers and arrowheads, pounders, stone bracelets or pendants, beads of steatite and shell, and coarse hand-made pottery. Those here exhibited are chiefly from the stations at Campos.

Table-Case L.

Selected Stone Implements, Continental.

Collection from **Denmark** (see also p. 89), including: large core (fig. 114) and flakes, scrapers, ground flint axes, chisels, knives (fig. 115), implements with serrated edges, series of pierced axe-hammers (fig. 116), some unfinished and showing the method of drilling the holes (as fig. 98), pierced mace-heads, flint "sickles," a basalt grinding-stone, arrow-heads, one (fig. 117) of the chisel-edged type, harpoon-heads of stag's-horn with their sides set with sharp pieces of flint (fig. 118); barbed harpoon-heads and axe of the same material. Examples of the most remarkable forms and the best workmanship are illustrated on plate 8 and comprise javelin-heads with serrated edges (Nos. 1, 3); a knife with handle in one piece (No. 2); a crescent knife, perhaps a sickle (No. 4); and an axe-head (No. 5) not unlike the kitchen-midden type (fig. 69), but ground on both faces near the cutting edge.

Collection from other Continental countries: large flakes, ground and polished axe-heads of flint and hard stone, flint arrow-heads, one with chisel-edge from **France**; axe-hammers and polished axe-heads from **Germany** and **Austria**, ground axe-heads of hard stone, (some highly polished), pierced axe-hammers, and arrow-points from **Italy** and **Sicily**; ground axe-heads from **Spain**, one beautifully polished and perforated near the edge; small axe-heads and chisels from **Greece**, and obsidian cores from the Greek Islands.

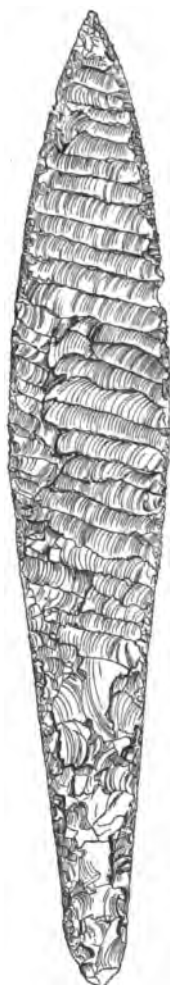


FIG. 115.—Flint knife, Denmark.

Superstitious Use of Stone Implements.

A ground nephrite axe-head obtained in Egypt and engraved with a Gnostic inscription probably added in Alexandria in the

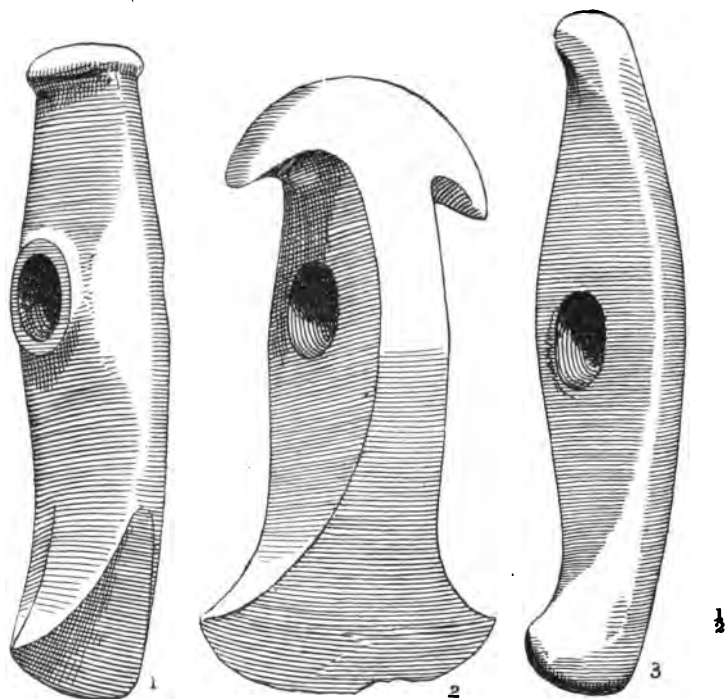


FIG. 116.—Pierced axe-hammers, Denmark.

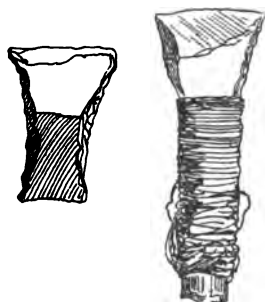


FIG. 117.—Transverse arrow head with original binding, Denmark.

4th century; flint flakes and arrow-heads worn as charms in Italy, one with an ancient Etruscan, another with a mediaeval setting (fig. 119); ground and polished jadeite axe with silver mount and perforated for suspension, said to have been worn in Scotland in the 19th century as a remedy against kidney-disease.

End of Case, below: Pierced axe-hammers of considerable size, used for the heaviest kinds of work and found chiefly in the north of England, as well as in Scotland. In the chalk districts of



PLATE 9. NEOLITHIC LANCE-HEADS OF FLINT, IRELAND.
(Table-Case M, see p. 105.)

the South flint nodules are often found that may have been used as hammers for flint-working or as missile weapons. A large pebble of green stone was probably used for crushing grain.

A tabular stone from Scotland has cup-shaped hollows probably

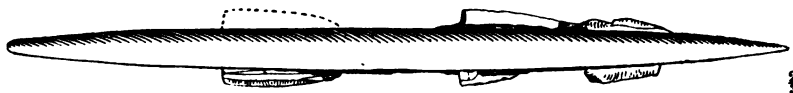


FIG. 118.—Harpoon-head with flint barbs, Denmark.

due to its use as an anvil in flint-working; and may be compared with the hollowed pebbles in Cases 112, 129, 132 (see fig. 38).

Table-Case M.

Selected Stone Implements, Great Britain and Ireland.

Exceptionally large ground axe-heads from Cumberland and Lancashire; series of flint and stone axe-heads either ground (fig. 120) or unground (fig. 121); arrow-heads from England, the



FIG. 119.—Flint arrow-heads, mounted as amulets.

specimen illustrated (fig. 122) being a fine example of "parallel flaking"; finely-worked lance and arrow-heads, and hollow scrapers from Ireland (plates 9 and 10): special prominence has been given to these objects in the illustrations on account of their excellent workmanship and the variety of their forms; it will be noticed

that some are ground and polished on both faces (fig. 123 and plate 8, fig. 6); scrapers and arrow-points from Scotland; several examples of the so-called "Picts' knives" from the Shetland Islands (fig. 124). These are very thin flat blades of green stone, perhaps used for scraping skins or removing whale's



FIG. 120.—Ground axe-head of flint, Thames.



FIG. 121.—Unground axe-head, Hitcham, Bucks.

blubber, and may have been fitted with some sort of primitive handle like that of the similar knife used by the Eskimo of Alaska shown in the accompanying illustration (fig. 125). Finely-chipped flint knives, one from the Thames (fig. 126) and closely resembling a comparatively modern example from the north-west coast of America (fig. 127); pierced axe-hammers; a peculiar adze

of chipped flint (fig. 128) from Dorset, accompanied by narrow flint implements (fig. 129) sometimes called fabricators or punches, for flaking flint implements, but hardly adapted for this purpose, which is better served by the use of bone or horn implements



FIG. 122.—Arrow-head with parallel flaking, Bridlington.



FIG. 123.—Ground arrow-head, Ireland.

such as that from Grimes's graves (Gallery, Case 125), or those used by the Eskimo in recent times (Ethnographical Gallery, Table-Case 187); they may possibly have been used for striking

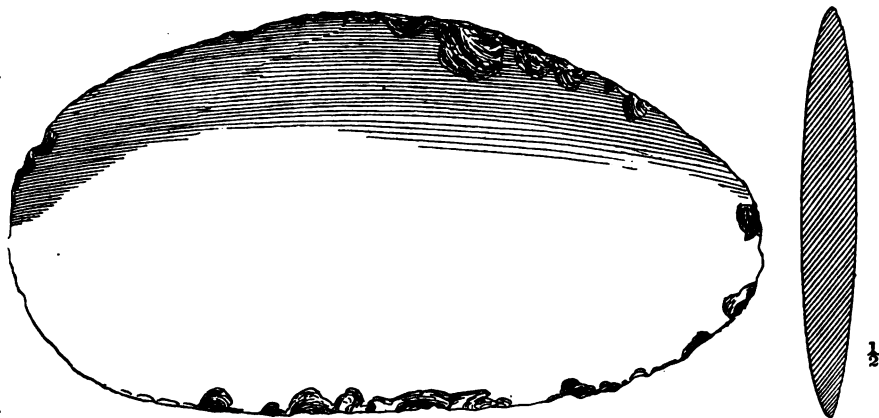


FIG. 124.—Pict's knife, Shetland Islands.

fire, a somewhat similar flint having been found with iron pyrites (fig. 130) in a Yorkshire barrow of the bronze period; several flat flint knives (fig. 131), almost circular in outline and with ground edges, perhaps once fitted with a wooden or other handle somewhat in the style of the Eskimo flinching-knife shown in fig. 125,

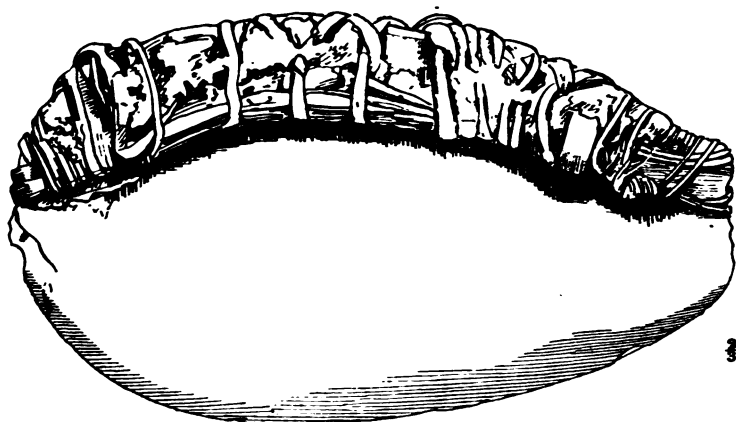


FIG. 125.—Eskimo knife, Alaska.



FIG. 126.—Flint knife, Thames.



FIG. 127.—Flint knife, N.W. Coast, America.

above ; examples of the implements made from diminutive flakes,

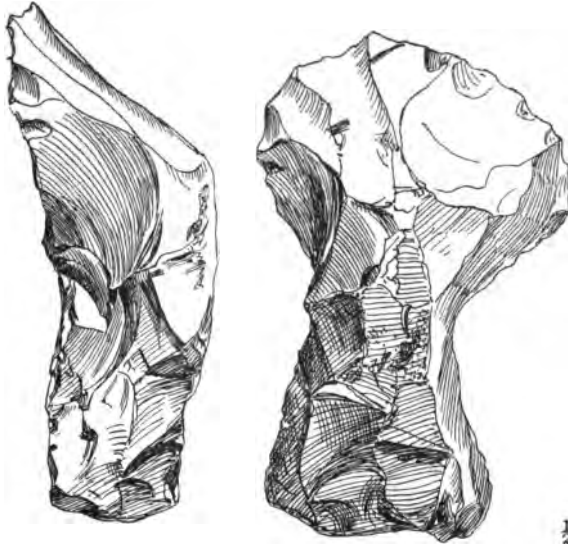


FIG. 128.—Flint adze, Dorset.



$\frac{2}{3}$

FIG. 129.—“Flaker”
or “fabricator,”
Suffolk.



$\frac{2}{3}$

FIG. 130.—Flint and pyrites for striking
fire, Yorks.

from the hills of East Lancashire (fig. 132). These minute and finely-chipped specimens of characteristic crescent, triangular, and

rhomboidal forms are often called "pygmy flints" and are found in India (Wall-Case 43 and p. 101), Palestine, Egypt (Gallery, Case 152), North Africa, Southern Spain, France, Belgium, and in several sites in Great Britain, notably in Eastern Lancashire, Scunthorpe in Lincolnshire, Sevenoaks, and Hastings. The curious persistence of the same forms in all these countries has led to the

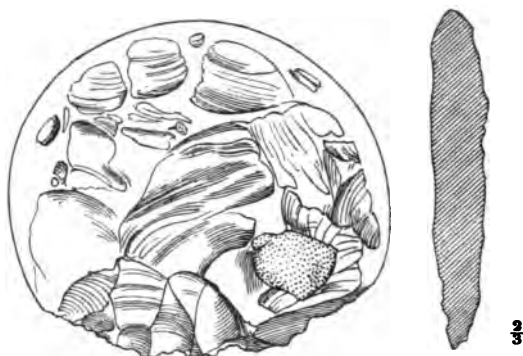


FIG. 131.—Round knife, Arbor Low.

conjecture that they are the work of one and the same race; but the same argument might be used to prove that the barbed stone arrow-heads of Europe, Japan, and North America were the productions of a single people. However it may be explained, the similarity of form is sufficiently striking to deserve careful attention. Various conjectures have been made as to the use of these minute implements, which are manufactured from small flakes, the natural edges being in most cases left untouched, and the thicker



FIG. 132.—Pygmy flint implements, E. Lancashire.

sides or backs carefully finished by secondary chipping. Some have supposed that they were tied to the points of arrows, others that they formed lateral barbs of harpoons, others that they were tattooing-instruments, others that they were fish-snags, others again that they were used for making holes in skins or even harder substances like shell. The last suggestion seems to be borne out in the case of the small points found in South Spain, as

diminutive shell-discs were found in association with them; but we need not assume that their use was in every case uniform, for very few show any signs of wear. The pygmy implements are usually assigned to the Neolithic or early Bronze periods.

At the end of the case, below, are large ground axes, axe-

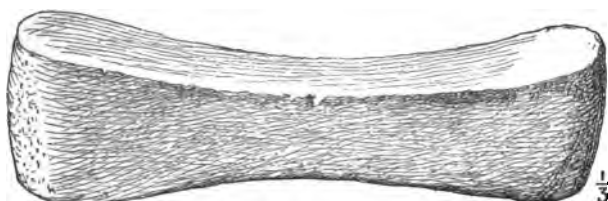


FIG. 133.—Grinding-stone, Dorchester, Oxon.

hammers, grinding-stones (fig. 133), etc., from Great Britain and Ireland.

Central Standard-Case S.

The Swiss Lake-Dwellings of the Stone Age.

In several parts of Europe, but more especially in Switzerland, primitive man lived for greater security in villages of wattle and daub raised upon high piles driven into the edges of the lakes. The settlements of this kind in the Swiss lakes are very numerous, and the antiquities discovered on the various sites show that this manner of life continued from Neolithic times through the whole of the bronze period into the earlier iron age. Attention was first drawn to the lake-dwellings during the exceptionally dry season of 1853, when piles were exposed on the shores of the lake of Zürich and numerous antiquities brought to light; and in succeeding years similar settlements were discovered in most of the larger lakes as well as in several of smaller extent, such as Inkwyl and Moosseedorf. The conditions obtaining in the smaller lakes have often been the most favourable from an archaeological point of view, owing to the formation in the more tranquil and shallow waters of a deep layer of peat moss, which has acted as a preservative to the more perishable objects. In these smaller lakes the piles were often raised and strengthened by heaps of stones and stakes round their bases; in the larger, piles were used alone. In some cases, as in the island of Borneo at the present day, houses raised on piles may have been built on dry land, but as a rule the lake-dwellers must have lived actually over the water, just as in New Guinea men still live in pile-villages

in the shallow waters of rivers and the sea (see figs. 82, 83). The remains found on the sites of the pile-dwellings built and occupied in the Stone Age, of which that of Robenhausen is considered the typical example, show that at this period the number of domestic animals possessed by man was still small, and that food was largely furnished by the wilder species; oxen were numerous, but the sheep, horse and domestic pig were extremely rare, not becoming general until the Bronze period. Of the wild animals then inhabiting the district, but now no longer occurring in Switzerland, the urus, bison, elk, and stag, were among the commonest.

But the lake-dwellers were no longer wholly dependent

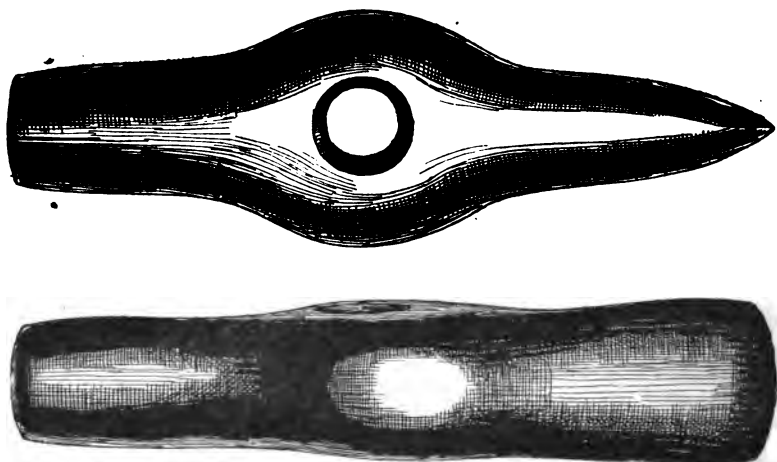


FIG. 134.—Pierced head of axe-hammer, Yverdon.

upon hunting for their livelihood. They cultivated wheat, barley, and millet, from which they made a rough kind of bread; they preserved apples and pears, and were also acquainted with the raspberry and blackberry. Although skins were still largely used for clothing, flax was grown, and garments were woven from it. Not only spindle-whorls of stone and pottery, but even pieces of woven stuffs have come to light. And the numerous earthenware vessels which have been discovered show that the art of the potter had made considerable progress, although the use of the wheel was still unknown. The most important implement or weapon was the polished axe, which was commonly of small size and made

of hard stone like diorite. It was often mounted in sockets of deerhorn and fixed in wooden hafts, the elasticity of the horn socket rendering the haft less liable to split. Other weapons and implements were flint arrow-heads, flakes and knives, rude stone hammers, and corn-crushers.

West side, and shelves at south end: Objects from lake-dwellings of the Stone Age on the Lakes of Neuchâtel, Bienne, Constance, Moosseedorf, and Pfäffikon.

The chief part of the collections is mounted on boards upon the slope, the site being indicated in each instance. The principal objects exhibited are ground stone axe-heads, many in their horn sockets, pierced stone axe-hammers (fig. 134), flint knives, and scrapers, arrow-heads, bone awls, chisels and knives, barbed harpoon-heads of deer-horn, and bones of animals, some split for the purpose of obtaining marrow.

At the bottom of the case may be seen fragments of coarse



FIG. 135.—Flint knife with wooden handle, Swiss lake-dwellings.

pottery with impressed ornament, and blocks of sandstone used for grinding stone axes.

On the top shelf at the south end of the case are specimens of textile fabrics woven of flax, fragments of nets, thread, a flint knife mounted in a wooden handle (fig. 135), and a stone axe in its original wooden haft and deer-horn socket (fig. 81).

On the lower shelf are boxes containing charred wheat, barley, and bread; dried apples, hazel nuts, and raspberry seeds.

Table-Case F.

Among the objects known to have been derived from primary interments in long barrows the following may be specially mentioned; four flint javelin-heads (figs. 136 and 138) of remarkably fine workmanship from Winterbourne Stoke Down, and flint arrow-heads from Fyfield and Walker Hill (fig. 137), in Wiltshire, discovered during the excavations conducted by Dr. Thurnam; jet bead of exceptional size and shape, from a long barrow at Burton Fleming, E. R. Yorks; fragments of pottery from West Kennet, Wilts. In connection with these fragments it may be

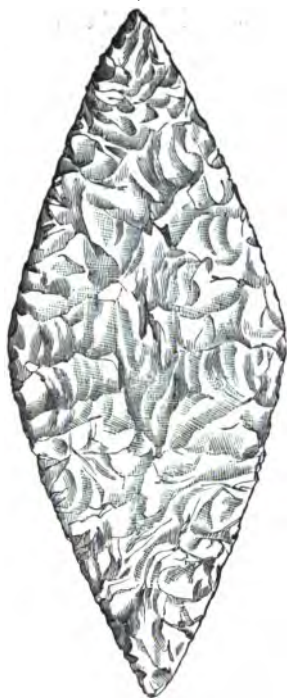


FIG. 136.—Flint javelin-head,
long barrow, Wilts.



FIG. 137.—Flint
arrowhead, long
barrow, Wilts.



FIG. 138.—Flint javelin-
head, long barrow,
Wilts.



FIG. 139.—Ornamented pottery
long barrow, Wilts.



FIG. 140.—Ornamented pottery,
long barrow, Wilts.

remarked that it is difficult to assign even a relative date to prehistoric pottery in this country. Neither the comparative coarseness of ware nor the nature of the ornament enable us to discriminate with certainty between the products of successive periods, and the pieces here illustrated (figs. 139, 140) are practically indistinguishable from the pottery usually assigned to the early Bronze Age and exhibited in the adjoining Wall-Cases.

Table-Case B.

For the study of stone implements, a knowledge of the distinction between natural and artificial fracture is necessary, and in nearly every case the method is unmistakable. By natural fracture is meant the splitting of the flint by some means other than a direct blow from the hand of man; and this may occur before the flint leaves its original bed, through earth-movements that crack and produce "faults" in the chalk. When exposed on the surface flints are often fractured by unequal expansion of the mass due to alternate heat and cold; by fire, which does not always imply human agency, but may be due to lightning, friction, spontaneous combustion, or other natural causes; and more especially by frost, when particles of moisture, enclosed in the stone, expand forcibly on conversion into ice. Fall from a height and impact with other stones on a beach are also natural agencies; and a secondary chipping not unlike human handiwork, but solely due to battering by the waves, is often noticed on pebbles of the shore.

The effect on flint of a sharp and somewhat heavy blow, such as that of a hammer, is easily recognised, and may be regarded as proof that the stone has been handled by an intelligent being. A "bulb of percussion" is the characteristic mark of a worked flint, and is produced on the flake struck off the core (as figs. 109 and 114), just below the point where the blow is delivered; but to produce this effect, the hammer must fall on a more or less flat surface of flint, and a series of flakes is obtained one at a time, by striking near the edge of the facet, the bulb of percussion leaving a corresponding hollow on the core or nodule. The inner or flat face of a flake has, therefore, the bulb at the butt-end, and the outer face shows either the original crust of the flint block, or, if already worked, one or more ribs in the direction of its length, marking the edges of flakes previously struck off.

It is on simple flakes rather than on axe-heads, knives, or arrow-heads that the bulb of percussion is visible, since the

majority of implements have been subjected to a secondary process of chipping, in which the blows are neither so heavy nor delivered vertically on a flat surface; so that the original bulb or corresponding hollow is effaced during manufacture. The finer chipping seen on some of the most highly finished specimens is not, however, effected by blows, but more probably by pressure, either by means of a flint "fabricator" or a tool of bone, wood, horn, or other material (fig. 141).

Prolonged exposure of flint on the land or its burial in almost any material, except brick-earth and certain clays, induces a glossy surface, sometimes called "patina," that may be observed on the majority of palaeolithic implements, and various shades of colour are imparted to the implement by contact with the surrounding material: thus, gravel produces an ochreous surface,

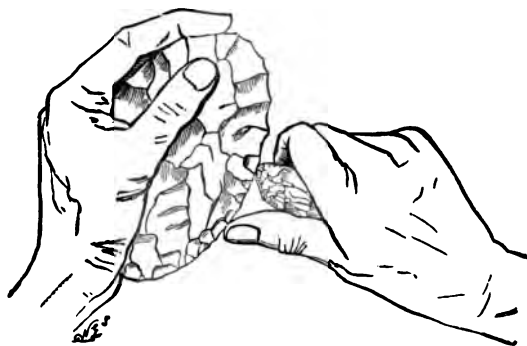


FIG. 141.—Mode of flaking flint by pressure.

while flints in chalk or a chalky soil have a white crust—that is to say, decomposition has reached a certain depth, and the altered material is stained by chalk held in solution. On the other hand, a large number of implements have been removed from clay and brick-earth with their surface unaltered in any way, and it is only by their undoubted discovery in certain positions that such specimens can be distinguished from modern productions.

A series of specimens collected by Mr. S. B. J. Skertchley and published by him in a memoir of the Geological Survey of England and Wales, to illustrate the modern methods of flint-working which are found to offer a remarkable resemblance to the processes adopted by neolithic man. The similarity extends to mining the material in the chalk (see Cases 125, 126), the form of the pick used by the miners, the shapes of many of the worked

flints, and (until recent times, when the French flaking-hammer was introduced) the use of a round-headed hammer. Before the introduction of iron, a pebble of hard stone, such as quartzite, was used for flaking, and the ends of the specimens here shown are bruised in that way. It is by no means improbable that many of the "scrapers" belonging to the Stone Age were really used in conjunction with nodules of iron pyrites for producing fire (fig. 130), and it may be pointed out that the gun-flint is only a variety of the domestic strike-a-light.

A small series of palaeolithic implements is here exhibited to illustrate certain characteristics, colours, and surfaces, due in a great measure to their great antiquity, and not to be found in the majority of neolithic implements, which belong to a comparatively recent period.

In the adjoining section of this Table-Case are specimens illustrating methods of hafting, and special attention may be drawn



FIG. 142.—Stone axe-head in original haft, Solway Moss.

to the neolithic axe, with its original handle now broken and distorted, found in Solway Moss (fig. 142). A cast of the hafted axe found in Ehenside Tarn (Case 131) is also shown; and a Case containing hafted implements of recent times from savage countries is affixed to the wall adjoining Case 152.

MOREL COLLECTION.

ON the opposite or south side of the Central Saloon (on the visitor's right after ascending the main staircase) will be seen in the Wall-Cases to the right of the door leading to the Anglo-Saxon collection, and in Table-Case N adjoining, series representing the Stone Age in France, derived chiefly from the Departments of Marne and Aube in the N.E., and from those of Drôme and Vaucluse in the S.E. of that country. These objects are exhibited in a separate place because they form part of a large collection, illustrative of all the early

archaeological periods in France, formed by M. Léon Morel of Rheims, and acquired by the British Museum in 1901.

Wall-Cases 63, 64.

Main shelf: A number of flint implements of the drift period from the Departments of Marne, Aube, and Vaucluse.

On boards at the back are worked flakes from the caves at Mentone; scrapers, worked flakes, etc., of brown chert, from factories of the later Palaeolithic Period at Villes and Mormoiron, Vaucluse; flakes, lance or arrow-heads, fragments of pottery, and stone beads from the cave of Mirabel, Drôme; the worked flints resemble types found at Solutr  (see Cases 111, 112, in the Stone-Age Gallery, and figs. 32-34), but if the fragments of pottery were actually discovered with the other objects, the find should probably be assigned to the Neolithic Period; flint implements and flakes from factories at Sompuits, Somsois, Poix, St. Martin, and Sommevesle (Marne); fragments of pottery, spindle-whorls, chert scrapers and arrow-heads, ground stone axe-heads, and bone awls, chiefly from a neolithic interment at La Rochette (Dr me), where the body was covered by a massive stone; brown chert flake, and necklace formed of discs of pectunculus-shell, from a neolithic burial at Cloye (Marne); flakes, ground stone axes, incised bones, and lower jaw of a child, the whole showing traces of fire, from an interment at Lignon (Marne), in which the bones of animals, split for the extraction of the marrow, were numerous, and the lower jaws of several children were discovered; ground flint axe-heads, worked flakes, transverse arrow-heads (see fig. 117), and fragments of human bone discoloured by the bronze bead adjoining them, found in one of the burial pits at Tours-sur-Marne, in which human remains were found in great numbers: the presence of the single bronze bead is of interest, as it shows that these pits belong to the transitional period between the Stone and Bronze periods; flint implements and arrow-heads of various types from the Departments of Marne and Aube.

Bottom of the Cases: Ground axe-heads of serpentine, diorite, jadeite, chloro-melanite, and other stones, from the Departments of Dr me and Vaucluse.

Table-Case N.

Flint axe-heads, ground and unground, ground axe-heads of various stones, chiefly from the Departments mentioned above; two ground axe-heads in hafts of stag's-horn; worked flakes and hammer-stones of flint; pierced stone axe-hammers; stone polishers.

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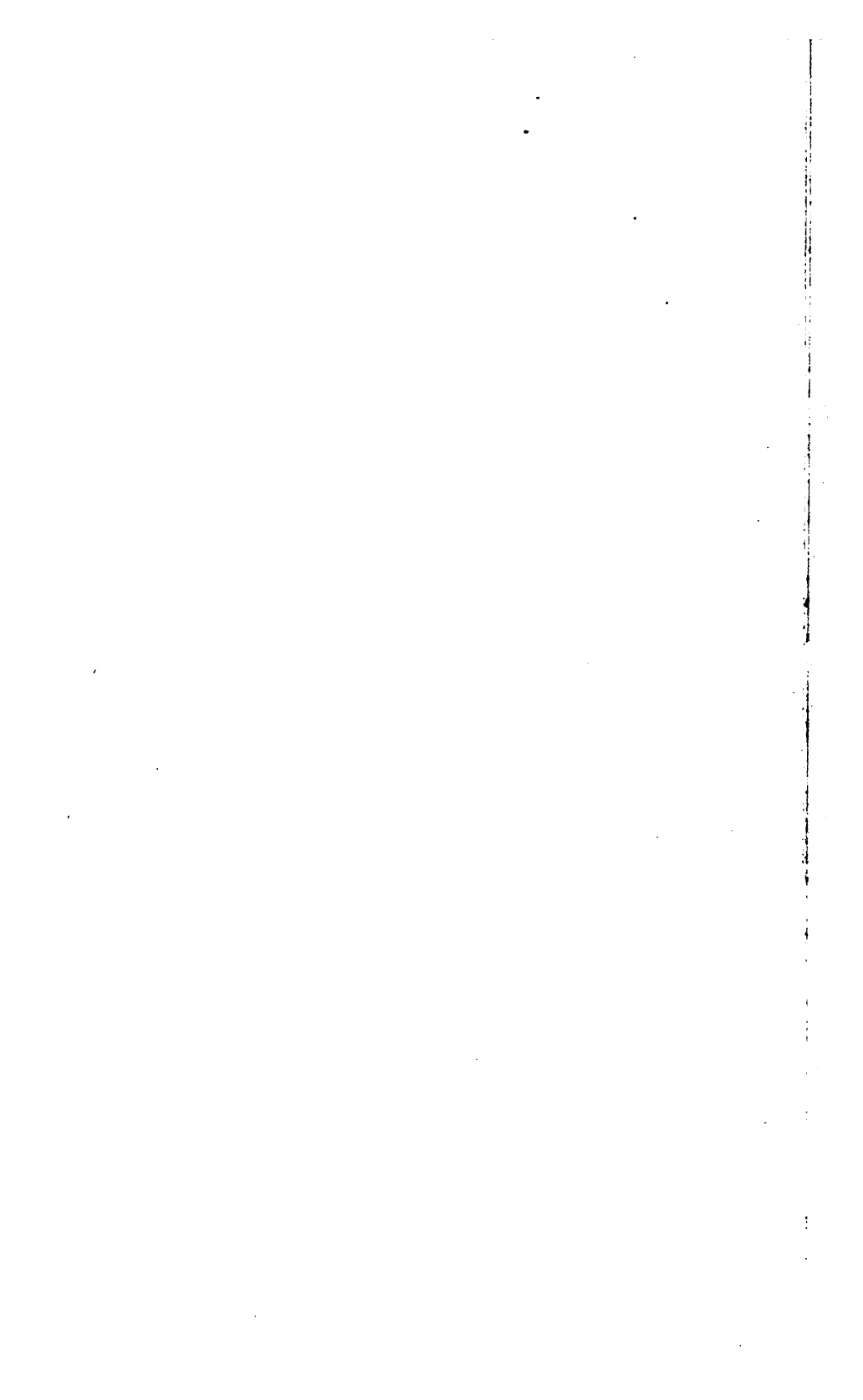
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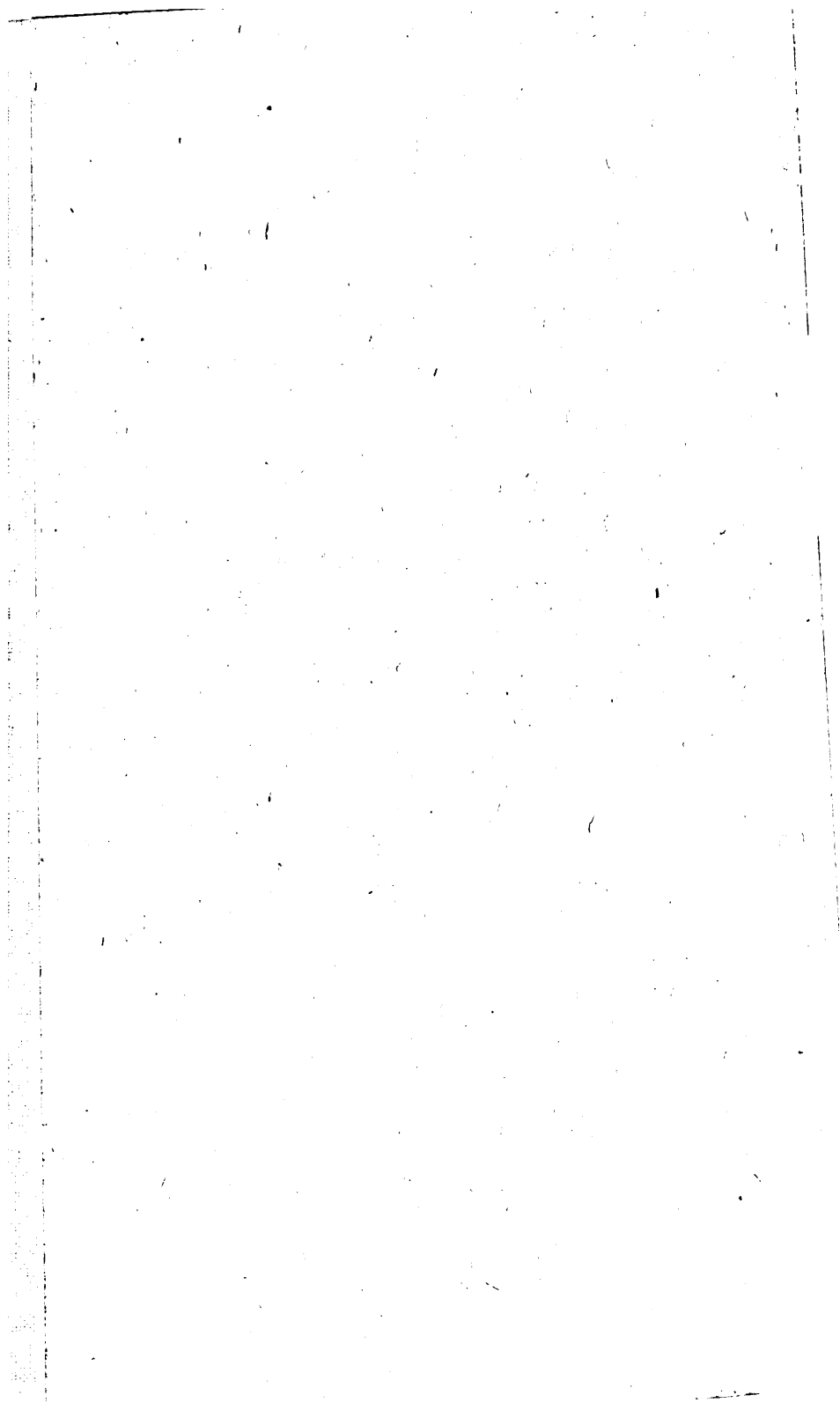
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